Volume 93 Number 3

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

BRISTLING with "shalts" and "shalt nots," like the Mosaic decalogue, the trade code being submitted to Washington by the American Iron and Steel institute under the national recovery act puts the industry in a moral strait-jacket. Not only are minimum wage rates and salaries prescribed, but new standards for selling also are set up (p. 11). Henceforth, contracts will be contracts and not merely memorandums; price schedules must be filed with the institute, deviations being punishable by fines; the institute may audit the books of suspected members; construction of new blast and open-hearth furnaces and bessemer converters is prohibited. If the President is giving the nation a new deal, the institute is giving the industry a clean sweep.

Labor Out To Heckle Steel

Filing of the code, almost simultaneous with announcements of wage advances, quells Washington's apprehensions of delay, but also puts the first open shop industry "on the spot" before organized labor. Washington speculates (p. 13) that conflicting opinions of the Johnson organization on collective bargaining will flare up at the steel hearing, but expects moderate views to prevail and labor to fulminate in vain . . . . "Assimilability" is a new word Washington is toying with as General Johnson scans (p. 14) the possibilities of placing employes crowded out of "full" industries in others requiring labor . . . . Secretary Ickes, now also administrator of public works, starts (p. 13) letting approved projects.

Business Is Better! Steel Hits 57%

While iron and steel executives have been concentrating on their code, production departments have been pushing their operations up 2 more points, to 57 per cent (p. 17). This week, the 1930 line may be crossed . . . . Fresh ordering of iron and steel is slack, for reasons that are no wet blanket on market enthusiasm, but specifications against contracts are brisk (p. 41). As a precaution against certain increases in costs, pig iron generally has been advanced $1 per ton . . . . Automobile manufacturers, engaged in shortening their work to 40 hours or less (p. 15), are maintaining their June rate of production . . . . Unfilled tonnage of the United States Steel Corp. regains (p. 12) its position as in indicator by pushing across the 2,000,000 mark.

Experience Is Part of Corrosion Test

When service conditions can be simulated, the Krupp sulphuric acid-copper sulphate accelerated corrosion test is reliable for determining the life in normal service of welded 18-8

Steel from the raw to every important use as a finished product is depicted in this exhibit of the United States Steel Corp. at the Chicago Century of Progress exposition. The photograph is by Kaufmann-Fabry

austenitic stainless steel (p. 23). However, the results become doubtful in gaging high-temperature service in the disassociation range under corrosive conditions where the time of exposure is long, and even alloys stabilized by additions of columbium, vanadium and titanium suffer inter-crystalline corrosion.

Research Spurs Progress in Alloy Development

Regardless of tests, the alloys are having their day . . . . Light weight structural shapes are being fabricated (p. 37) from 18-8 steel, the noncorrosive properties supplying permanent strength and rigidity and the austenitic properties insuring hardness by cold working . . . . Addition of 0.50 per cent molybdenum to 15 per cent chromium stainless steel increases (p. 31) its strength and wear resistance . . . . In Germany, nickel is added to high-chromium steel (p. 37) to offset brittleness caused by the alloying with silicon and aluminum to increase resistance to scaling . . . . Steel castings better withstand high temperatures and pressures when 1.50 per cent chromium and 0.60 per cent molybdenum are incorporated (p. 31).

Where Steel Is Cheaper than Backs

Machines for floor sanding, waxing, polishing and scrubbing supply a "large use of steel in small ways" (p. 34), about 200 tons of steel being required annually for building the larger sizes of these machines, including motors. Smaller types account for as much more . . . . A use for steel that occurs once in a century is in the inspiring Avenue of Flags, greeting visitors to the Century of Progress in Chicago at the northern entrance (p. 27). Forty six large flag-bearing standards of all-welded steel construction were fabricated from 136 tons of plates and channels and 29 tons of pipe. In addition, 6000 feet of ½-inch steel cable is utilized. These standards, designed to stand a wind pressure of 100 miles per hour, have already resisted a gale of 70 miles per hour.

New Methods, Materials in Engineering Parade

Future open-hearth practice will require (p. 28) not only complete insulation of furnace ends, probably by steel plate, but also insulation of buckstays, the material to be limited to that having great mechanical strength . . . . The foundryman is now opening the door of the aluminum age, states (p. 26) the new president of the Institute of British Foundrymen . . . . Tantalum carbide is now used (p. 37) for wire drawing dies, mandrels, precision instruments and other applications involving resistance to wear but no cutting action . . . . A triple alloy of manganese, silicon and aluminum as a mold addition brings (p. 37) the rimming action of basic open-hearth steel under better control.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

To the Editor:

State after state is passing laws to license engineers so that up to the present time 28 of them have statutes to define the qualifications of those persons who desire to follow the vocation of an engineer. The purpose back of such laws is without question one that deserves the support of the engineering world in general. However, certain ambiguities have crept into some of these statutes that ought to be corrected.

All types of engineers are generally covered by one certificate of registration. There are provisions in some of these laws that require a professional engineer to have four years or more of active practice in engineering work. If all subordinates on an engineering project must be registered how are they to secure the required experience the law demands unless some provision is made to provide for several divisions or grades, each of which would be a stepping stone to the next higher rank.

Any engineer who is responsible for the design and construction of certain structures or machines should be subject to the requirements of any such registration laws. However, many of his subordinates, who are competent to handle certain details of such projects, should either not be subject to such laws or special provisions made to grade them according to their particular qualifications.

C. E. SCHIRMER, Chief Engineer,
Hoist & Crane Division,
ROBBINS & MYERS SALES INC.,
Springfield, O.

To the Editor:

Courtesy, intelligent co-operation, consideration; all without the prospect of any tangible return.

I would like, with your permission, to apply the above terms to some hundreds of American industrial companies with whom I have had vocational and avocational contacts in the last 20 years. My reason for doing so now is that it seems a long while since I have seen anything favorable said about American industry. And I have just been the recipient of an unusual business courtesy.

In connection with the activities of a small group of amateur mechanics, I recently wrote to the manufacturers of a preparation for protecting the surfaces of metals from corrosion. I was told that the product I inquired for is no longer made but that the company would have its laboratory make a quantity for me. Today, I received a substantial shipments of this product, for which the company is making no charge.

This is the latest and most important of a long series of accomodations granted by industrial companies in response to queries which must have been troublesome and trifling. Many times, overworked engineers have taken the trouble to write long letters containing valuable information about their companies' products and busy executives have granted interviews—purely favors to me.

The answer is, of course, that these actions create good will and I want to go on record as appreciating the length of vision which recognizes that fact.

Incidentally, I think you do not realize the number of readers you have, not in the steel industry, who read your publication steadily because it is interesting and informing. I have met a number who do so. In my own case, my purchases of automobiles and many other products have been influenced by information in STEEL.

ALFRED W. MILLER,
E. C. VANDYKE INC.,
120 Broadway, N. Y.

Virile Steel Code Approved; Many Interests Raise Wages

NEW YORK

EXECUTIVES representing over 90 per cent of the iron and steel industry, meeting in special session in New York Thursday upon invitation of the American Iron and Steel institute, approved in principle a trade code for submission to Washington under the national industrial recovery act.

Following approval, the code underwent the further scrutiny of legal counsel for the institute. This was expected to delay its filing in Washington until early this week, possibly after another meeting of the institute's executive committee.

A document of probably 12,000 words, the code covers many controversial points, the objective being to eliminate the necessity for a continuing committee, such as was set up in the textile industry, first to submit its code.

The code not only prescribes a maximum work week of 40 hours, to be averaged over a six-month period and hourly wage rates for common labor ranging from 25 to 40 cents, but also provides the machinery for maintaining prices, puts contracts on a firm basis and in general for policing the industry and insuring remunerative levels warranting the shorter week and increased wages.

High Spots of Code

The code, which will not be formally announced until it has been submitted to the recovery administration at Washington, briefly is understood to provide the following:

An hourly wage rate of 25 cents in the South; 27 cents at Birmingham, Ala.; 35 cents in the East, Kansas City, Mo., San Francisco and Los Angeles; 37 cents at Johnstown, Pa., Canton and Massillon, O., southern Ohio, Indiana, Illinois, St. Louis, Duluth and Seattle; 38 cents at Buffalo; 39 cents in Utah and 40 cents at Pittsburgh, the Mahoning valley, the North Ohio river, Cleveland, Detroit, Toledo, Chicago and Colorado districts.

The maximum work week is 40 hours, to be averaged over a six-month period to provide for rush and emergency shipments.

For more than 40 hours a week, time and a half is to be paid for the excess.

For office workers, supervisory and technical workers the minimum wage is to be 15 per cent above the minimum paid at any time during the depression.

Wages and salaries now being paid in excess of the proposed minimum are not affected.

Where mills have contractual arrangements with workers based upon the sales prices of their products, wages are to be promptly readjusted on the basis of current selling prices instead of waiting until the usual time for the examination of sales records.

No changes are proposed in existing basing points for pricing steel products nor are base prices or differentials referred to, but these may be later included as an amendment to the code.

Producers will file with the institute complete schedules of all prices. Sales made at lower levels to the detriment of the industry at large will be punishable by a fine of $10 a ton on all steels thus sold.

Memorandum contracts are eliminated and for them are substituted firm contracts requiring the customer to take the entire tonnage covered, without protection against price declines.

Consignment shipments are discontinued except on iron and steel pipe.

Expenses To Be Pro-rated

The institute may demand full information from every company concerning its operations, sales, labor and other details and may employ independent auditors.

Expenses of the institute incurred under the code will be treated separately from general expenses and will be borne on a pro rata basis.

Voting power also will be on a pro rata basis.

Construction of new blast and open-hearth furnaces and bessemer converters is prohibited, but no restriction is placed on the construction of new finishing capacity.

All contracts will be honored.

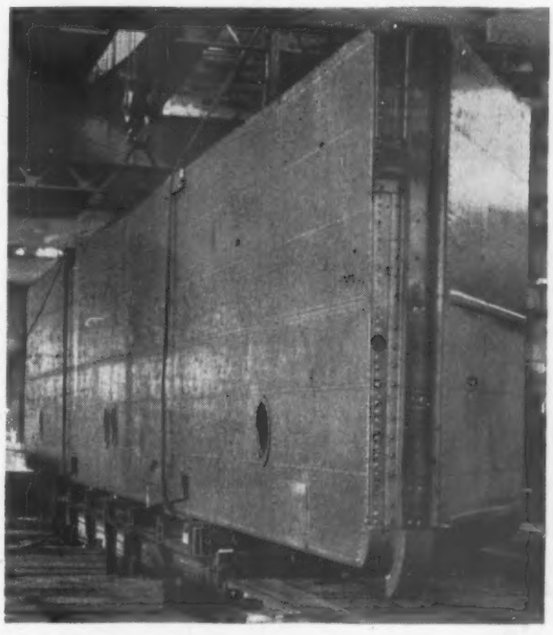
The meeting in New York at which virtually unanimous approval was given to the trade code was under the direction of the executive committee of the institute, with Eugene

Ore, Steel, Coke, Autos Lead Rise in Carloadings

AN INCREASE of 10 per cent in carloadings in the third quarter, to a total of 4,224,077, compared with 3,841,768 in the third quarter of 1932, is predicted by Regional Shippers' Advisory boards.

Largest increase for any commodity is ore and concentrates, for which 169,015 cars will be required, or 92.5 per cent over a year ago. For coal and coke the estimated requirement is 1,374,788 cars, or 11.7 per cent over last year.

The estimate of iron and steel loading is 184,471 cars, a lift of 47.1 per cent. For automobiles, trucks and parts the increase is 49.1 per cent to 54,048 cars.



FEW vessels are launched 300 miles from the yard in which they are built, but the McClintic-Marshall Corp. did this recently when it built in three sections a 95-foot barge for the federal lighthouse service. It built the barge at Leetsdale, Pa., on the Ohio river, but instead of launching it there lifted it by crane to Pennsylvania railroad flat cars and shipped it to Buffalo, where it was assembled and launched. Photo is by courtesy of the Pitsburgh Sun - Telegraph

G. Grace, president of the Bethlehem Steel Corp., and W. A. Irvin, president, United States Steel Corp., the leading factors. The code was to be taken to Washington by R. P. Lamont, president of the institute.

A hearing on the code was expected to be set by Gen. Hugh S. Johnson, director of the recovery administration, beginning seven days after the formal filing of the code.

At Washington it was intimated that Kirke M. Simpson, consulting engineer and metallurgist and president of the International Chromium Process Corp., would be the deputy administrator in charge of the steel code.

Over the week end it was expected that many producers of iron and steel would announce horizontal wage advances, effective immediately, and possibly compelling some revision of the rates previously approved for the code.

The McClintic-Marshall Corp., a subsidiary of Bethlehem, Friday announced wage advances ranging from 10 to 20 per cent. Similar action was expected by the other leading fabricator—the American Bridge Co., a subsidiary of the Steel corporation.

The Great Lakes division of the National Steel Corp., at Detroit, is increasing wages and salaries 15 per cent as of July 16.

In anticipation of the shorter work week iron and steel producers in many districts have been taking on employes. In the Youngstown district, for example, it is believed that at least 8000 additional will be required.

National Machine Tool Builders' association voted practically unanimously at a special meeting in Cleveland, Thursday, to join the newly formed Machinery and Allied Products institute and come under the code of the institute. This code sets the work week at 40 hours, with permission to average this rate over 26 weeks.

J. G. Benedict, general manager, Landis Machine Co., Waynesboro, Pa., has been appointed representative of the association and will go on the board of the institute as soon as the application for membership is approved. Lines of manufacture not formerly eligible will be admitted to the Tool Builders' association.

A minimum wage of $12 for 40 hours of labor in foundries and machine shops, except for apprentices, helpers, outside labor and those who do not use machinery or tools as a part of their regular duties, is prescribed in the code considered by the Southern Metal Trades association at a special meeting at Atlanta, Ga., Friday.

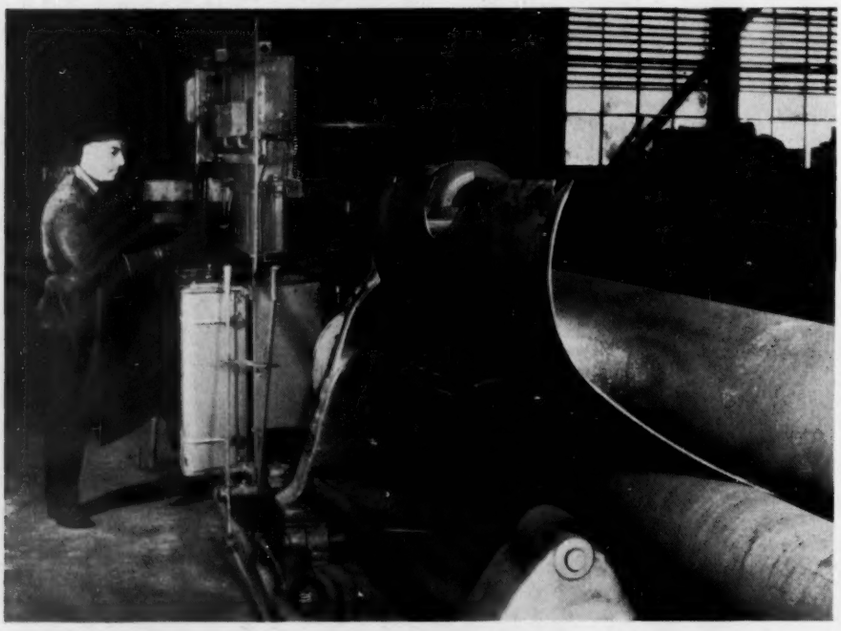
H. D. North, president, Ferry Cap & Set Screw Co., Cleveland, is chairman of the newly-formed United States Cap and Set Screw bureau, to draft a code for that industry.

All producers of sash weights for windows, balance weights for elevators and counter weights of all kinds are being invited to join the new Sash Weight Association Inc., 17 East Forty-second street, New York. A steering committee has been authorized to draft the code.

I. Wilkoff, of the Wilkoff Co., Youngstown, O., is chairman of a special committee on nonferrous metals authorized by the Institute of Scrap Iron and Steel Inc. This is the first excursion of the institute beyond the field of scrap iron and steel.

Sam Tour, Lucius Pitkin Inc., New York, is secretary of the Nonferrous Foundry association which has set up ten districts and is holding organization meetings in each to facilitate the drafting of a code.

At a New England industrial conference, in Boston recently, a resolution affirming belief in the open shop was adopted, and New England manufacturers were urged to exercise caution in adopting codes or agreeing to any impairment of satisfactory relations with employes.



QUARTER-INCH THICK, YET TRACTABLE: One half of outer casting for a domestic oil-burning heating unit being bent at Pittsfield, Mass., works of the General Electric Co.

Steel Bookings Make Gain; Largest Backlog in Year

Unfilled orders on books of the United States Steel Corp. as of June 30 totaled 2,106,671 tons, a gain of 176,856 tons over May 31 and the highest backlog since May, 1932.

The enlargement of tonnage thus balances the losses of the past year. The increase is the largest in tonnage since January, 1931, when the added tonnage over the preceding month was 188,755 tons.

Inasmuch as shipments of steel were at an unusual rate during June, this accumulation of tonnage is the more remarkable. Much buying recently has been for immediate delivery and mills have been pushed to get out material for consumers urgently in need.

Places Large Can Order

Sinclair Refining Co., New York, having decided the market for lubricating oil is entirely in factory field cans, has placed an order for 4,000,000 cans with the Continental Can Co., New York. Oil in cans is to be offered at no change in price. All Sinclair stations will be equipped with presses for converting empty cans into bales.

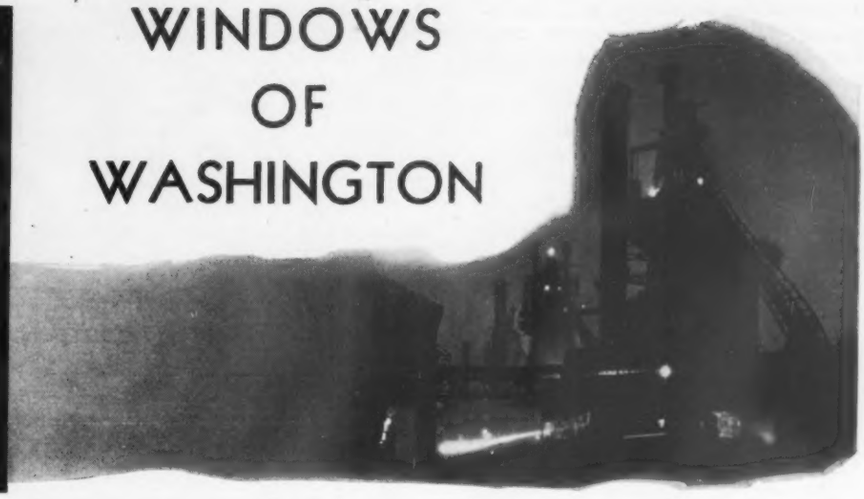
Tax Refund Is Granted

Refund has been granted to the John Illingsworth Steel Co., Carl F. Weihman and George R. Casey, receivers, Philadelphia, amounting to $43,836.67, as overassessment of income tax for 1919, by the bureau of internal revenue.

Drawback Is Allowed

Drawback has been allowed by the treasury department on broaching tools manufactured by the Lapointe Machine Tool Co., Hudson, Mass., with use of high speed steel manufactured under drawback regulations.

WINDOWS OF WASHINGTON



WASHINGTON

UNLESS peace is made behind the scenes, smoldering opposing views on labor within the national industrial recovery administration will burst into full flame this coming week when the hearing on the iron and steel trade code begins. It may be Armageddon for the entire industrial program.

From the start, Gen. Hugh S. Johnson, administrator, has been unequivocal in his stand that organized labor will not be permitted to force unionization of open shop industries—provided, of course, satisfactory wage rates and work weeks are set up.

Its lobbyists having written the collective bargaining provisions into the act, organized labor is not disposed to surrender its advantage. Even when the textile code, covering an industry that is well organized, was heard, labor was surprisingly combative.

Preliminary negotiations on the bituminous coal code disclosed a program that would virtually have compelled the unorganized portions to treat with the United Mine Workers. Recent observations of Donald Richberg, chief labor counsel, have almost attained the proportion of a threat and have called for soothing explanations by General Johnson.

Now that the iron and steel code is up, the first occasion for labor to show its full hand is presented. American Federation of Labor officials have observed that the new company unions would vanish "like hoarfrost." Secretary of Labor Perkins forecast that these "war bridegrooms" would have no standing.

So it looks like an enfilading fire upon representatives of the iron and steel industry when they undertake to explain the provisions they have made for collective bargaining. The betting odds are that while iron and steel will be put on the defensive, the fireworks of labor will be wasted and more temperate views will prevail.

Incidentally, the labor situation is not at all to General Johnson's liking. He is in the incongruous position of having to contend with belligerent labor views within his own organization, the labor advisory group having been appointed by Secretary Perkins and eight out of nine members being officials of unions.

Labor To Hit Steel Code?

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Start Letting Public Works

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Seek To Relocate Jobless

OTHER industries have beaten iron and steel to the post with their codes, but in importance to the recovery administration the iron and steel code is No. 2, ranking after textile.

Industry has speeded up notably in the past week. Part of this is due to the organization by President Roosevelt of his council of administrators and co-ordinators and his threat to issue a blanket order specifying minimum wages and maximum hours.

Late Friday it appeared that industry would be directed to adopt a 35-hour week and $14 weekly minimum wage, with a 40-hour week and $15 weekly minimum for clerical employes, pending the adoption of definite codes and wage setups for each industry.

But the Johnson administration has been quietly contacting industry, giving assurances that moderate opinion would govern despite the broadcasting of radical views by the "social minds."

Typical of this backstage negotiating, Myron C. Taylor, chairman of the United States Steel Corp., conferred with President Roosevelt Monday, the call for a general iron and steel meeting was issued Tuesday, the iron and steel code was adopted Thursday, general wage advances were announced on Friday, the code is due in Washington early this week.

While the code of shipbuilders has been scheduled for July 19 and that of the lumber and timber products industry set down for hearing July 20, the iron and steel code will "steal the show"; it will set more of a precedent for the remaining industries than the textile code. The official codes of the bituminous coal, electrical, oil, general contracting and cloak and suit industries have also been filed.

A SEMBLANCE of order is appearing in PWA (public works administration) after a month of uncertainty as to personnel and policy. Since the act was signed, three different administrators have been on the job. The latest incumbent is Secretary of the Interior Harold L. Ickes, whose additional title is "federal administrator of public works." His chief assistant is Col. H. M. Waite.

How much of the $3,300,000,000, provided for public works in the recovery act, will be spent, still is an open question. Newspaper reports referring to using the money at the rate of half a billion monthly were exaggerated. Director of the Budget Douglas believes that in view of the recent improvement in business only a small portion of the amount should be spent.

To date $753,513,610 of the $3,300,000,000 has been earmarked. Some weeks ago President Roosevelt allocated $400,000,000 of it to federal roads and $238,000,000 to the navy for shipbuilding. Administrator Ickes has allotted an additional $115,513,610, distributed as follows:

Federal projects, $64,561,542; nonfederal projects, $952,068; roads in national parks, forests, Indian reservations and public lands, $50,000,000.

Important in the list of federal projects are $200,000 for Arlington bridge approaches, Washington;

$443,000 for relocating and improving air beacons and airway radio facilities under bureau of aeronautics; $5,353,551 for repair, replacement and improvement of lighthouses, light ships and other aids to navigation; $100,000 for repairing plant of bureau of standards; $210,008 for reconditioning the Alaska railroad; $38,000,000 for Boulder dam project; and $1,344,480 for repairing immigration stations.

The nonfederal projects include 25 municipal waterworks and sewage systems in 14 states.

Reinforcing bars and mesh are the steel products likely to first feel the influence of these PWA allotments. Roads will take 60 per cent of the $753,000,000 earmarked to date.

Most of the engineering involved is completed or under way; therefore, specifications for steel reinforcing should be out in a few weeks. On many of the other projects, steel awards probably cannot be expected in less than 60 or 90 days.

IN SPITE of widespread interest in housing and the availability of federal funds for such work, projects are developing slowly. Robert D. Kohn, former president of the American Institute of Architects, is head of the housing section of PWA. His associate is Max Dunning, Chicago architect, who, during the past year was in charge of housing in the R. F. C. administration.

One of the interesting projects which received R. F. C. aid under his direction was that of the Ford County Housing association, Dodge City, Kans. The government advanced $155,000 to enable the association to build 100 houses, each on a 2-acre plot.

There is strong support in Washington for housing of this type, as well as for slum elimination and other improvements affecting the social angle. Progress, although slow, may be expected.

Not much has been heard of the problem of housing the forest army next winter. There are 1400 forest camps. If all the workers were to be housed in semipermanent or permanent quarters, 5600 dormitories would be required. About 200 men are stationed in each camp. Four dormitories, each accommodating 50 foresters, would be required.

Workers in southern states probably could go through the winter comfortably in tents. Men in northern camps either must be transferred to milder climates or be provided with better shelter. Wood and steel interests are watching developments closely.

GENERAL JOHNSON is leaving no stones unturned in his effort to find jobs for the unemployed. A few weeks ago, when it became evident that shortages in several classes of skilled labor were imminent, he instituted a study of the labor requirements of the leading industries. The purpose was to find out how many workers from inactive industries can be absorbed by or transferred into the active ones.

The departments of commerce and labor are participating in this study. Records of the automobile, lumber, furniture, tire, iron and steel and other industries are being examined to determine how many workers each can "assimilate" from the building and other inactive trades. The word "assimilability" is being pressed into use, to indicate the degree of ability of one industry to take up slack of employment in others.

Building construction, still lagging behind all other important activities in percentage of operations to capacity, furnishes the largest number of craftsmen available for transfer to other fields. Investigators are trying to find out how many sheet mill catchers, for instance, can be recruited from idle hod carriers, auto body polishers from window cleaners, furniture cabinet makers from carpenters, and so on.

ACTING for Railroad Co-ordinator Eastman in the matter of standardization of materials, supplies and equipment, and with simplifying and improving purchasing methods, is R. L. Lockwood, of Washington, heading up the section of purchases.

His views on the price of rails may become exceedingly important to the industry. It was Mr. Eastman as member of the interstate commerce commission with whom Senator Couzens lodged his protests against the unchanged $43 level for rails, and it was via Mr. Eastman that the protest was transmitted to the department of justice.

Great as has been the increase in demand for equipment, there is no large equipment buying program in sight. For one thing, the section of car pooling which has been set up in the Eastman organization will make the present supply of cars more liquid.

Other sections set up in the Eastman organization deal with freight service, and will attempt to modernize railroad methods to compete more efficiently with motor trucks and other transportation agencies, and to expedite less-carload freight and perhaps further store-door delivery.

SPEED with which the shipbuilders whipped their code into shape is explained by the complications arising from the $238,000,000 naval shipbuilding program. The code was submitted to the recovery administration on Wednesday. General Johnson immediately called a hearing to begin Wednesday, July 19.

Bids on the navy program close on July 26. Since the cost will be influenced by provisions of the code, it was essential that the builders and government reach an agreement in time to enable the former to prepare their bids intelligently.

But that is not the only complication. The tentative life of the recovery act is two years, while the navy construction program extends over three years. The license feature of the recovery act, if it should be invoked, extends for one year. Reconciling these various factors in preparing estimates will not be easy.

The shipbuilders' code is a model of simplicity. It consists of 10 paragraphs, seven of which could have been written in half an hour by any competent shipbuilder with legal assistance. The other three, which are the only ones involving controversial questions, deal with wages and hours, and costs.

The wage-hour provisions read as follows: "No individual will be employed in excess of 40 hours in any one week except as exempted in the act. The minimum rate of pay for labor ,except apprentices, casual and incidental labor shall be 35 cents an hour in the South and 40 cents in the North."

The paragraph relating to costs states that "members signatory to this code agree that it shall be an unfair method of competition to sell below a reasonable cost arrived at by a system of formulas established by the associates."

The "associates" referred to are the National Council of American Shipbuilders and the New York and New Jersey Dry Dock association. The code is simplified considerably by excluding the details of the cost formula. If this method is approved by NIRA, it will mean much to scores of associations which have been working over cost data for inclusion in their codes.

British Buy Wabana Ore

Newfoundland has sold 25,000 tons of iron ore from its Wabana mines to British blast furnace interests, Premier Frederick C. Alderdice has announced. This is the first result of a Newfoundland-Great Britain agreement at the British Empire Economic conference.

British Institute To Meet

The autumn meeting of the British Iron and Steel institute will be held in Sheffield, England, Sept. 12 to 15. There will be visits to the principal steelworks of Sheffield and Scunthorpe..

DETROIT

Shorten Auto Work Week

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Production Continues Strong

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Ford Sells Iron, Scrap, Coke

TURNING into the last half of July with the month's production assured at practically a parity with June, automotive executives are increasingly concerned with the trade code required of them by the industrial recovery act, and the manner in which the steel code will affect them.

Some General Motors divisions have adopted a 7½ hour, 5 day schedule, but this limitation of 37½ hours per week is on the individual only, as certain departments are operating three shifts a day and a few six to seven days a week.

Having expanded its production facilities and become better geared to the unprecedented demand for Plymouth, Chrysler is shortening its work week in the plant to at least 40 hours. There has been a little grumbling because rates have not been increased to offset the reduction in hours. The office staff, however, has had the equivalent of an advance through lowering of the week to 8 hours, 5 days, with no adjustment in weekly pay.

Ford continues to operate on a basic week of 8¼ hours, 5 days, but improved sales and heavier schedules in anticipation of the August shutdown have compelled some departments to move up to a 6-day week. An increase of $1 in the Ford daily minimum wage is rumored.

Because only a presidential ukase could compel unionization of the automobile industry, the only decision concerning collective bargaining, as required in the recovery act, is the manner in which the industry will foster it.

Preliminary reports on the use of welfare departments as nucleuses for employe representation plans are encouraging, although both the United States Steel and Bethlehem employe plans are being studied.

Assemblies now appear to be at their summer peak and the prospect is that August will develop a seasonal letdown, but the trend of employment in Detroit continues up, largely because the shorter week necessitates a spreading of work.

But as new employes are taken on they must be vouched for by reliable persons or present a satisfactory record, this precaution being taken to minimize the entry of agitators. Communists as well as the American Federation of Labor are awaiting a favorable opening; both have active headquarters here.

Incidentally, at many plants newcomers are now being hired. It is believed that all available old employes desiring to return have reported, and qualifications rather than past employment are deciding factors.

Despite the lack of a code, which is expected to be presented by Aug. 1, the automotive industry believes it has generously complied with the spirit. Many manufacturers have increased wages 5 per cent, and the average for what would be considered common labor is believed to be close to 50 cents an hour.

The trend toward the 37½ to 40-hour week also meets Washington's specifications. An important issue will be the length of the machine week, which in the textile code was made twice the 40-hour labor week.

Superficially, it would appear impossible for either Chevrolet or Plymouth to duplicate June or July production if limited to an 80-hour machine week without increasing facilities. Ford, however, has not been pressed recently to utilize potential capacity at Fordson, nor have the medium and high-price manufacturers.

IRON and steel prices are going higher, automobile executives are certain, but the 1933 model year is so far along that the effect will be negligible.

Practically all of the material to be shipped in July and August has been entered at levels prior to the recent advances, and this material will be fabricated in September and October, thus carrying most manufacturers to the end of their runs on the current series.

For all practical purposes, the automobile industry has manufactured its 1933 lines with iron and steel obtained below the cost of production. Since the steel code is being drafted entirely from the standpoint of the producer, for one thing to regain a remunerative basis and to re-establish justifiable relationships between hot and cold-rolled products, sharp advances are anticipated.

A speedy determination and test of the new iron and steel prices is desired by the automotive industry because costs are being assembled on 1934 models. An average advance of $5 a ton in the cost of finished steel would be almost certain to result in a higher f.o.b. price for automobiles, especially considering that a saving of 10 cents per car is something that is hotly contested.

If, as seems probable, a one-price basis is attained by steel it will be a relief to both sellers and buyers, minimizing "shopping" to insure that no competitor has forced a lower price. Sellers will stress quality and service and sharpen their pencils less frequently.

A one-price basis is expected to accrue to the advantage of local producers. If an exception is not made of the Great Lakes division of the National Steel Corp., the Newton Steel Co., and the tube and cold drawn interests, their advantage will be roughly the measure of the freight from Pittsburgh, or $5.80 per ton. There is, however, the possibility of an offset in case it is decided that the 3 per cent Michigan sales tax applies to raw materials.

The Rotary Electric Steel Co. (Michigan), which is bringing in its new plant, with a production of 7500

to 10,000 tons of standard-analysis, cold-drawn bars monthly, about Sept. 1, has not yet decided upon a price policy. Its rotor and electric furnaces are practically installed, and the foundations are in for the 12 and 18-inch mills. It has been taking in tonnages of scrap for its electric furnaces, this being a 100 per cent scrap operation.

Buick and Pontiac have experienced some delays the past ten days owing to an actual shortage of steel. Sheets over 60 inches wide in particular are behind delivery. One large manufacturer has canvassed warehouses in an effort to determine to what extent mill deliveries on sheets can be supplemented.

June shipments of steel into Detroit were the largest for any month in history for some suppliers; for others, the greatest since early 1930. Specifications already in hand insure a July practically as good as June. New buying, as contrasted with specifications and releases, has declined considerably, which is natural immediately after the turn of a quarter. This would indicate some letdown in August, although there will be some overflow from July because the mills will not be able to fill all July specifications.

The influence of General Motors thus far has been on the side of a stationary condition of automobile prices for the life of present models. Its raw material position, however, is relatively better than that of its competitors, it having made large commitments last fall for pig iron and certain kinds of steel that will carry it through the model year.

A FURTHER revision lifts the Chevrolet schedule for July to practically 80,000 units, which compares with an actual output of about 82,000 units in June and 65,000 in May. The original schedule for July was 65,000.

A few weeks ago Chevrolet retail sales in the East contracted moderately, but a rapid comeback has not only restored the Tarrytown branch assembly plant to capacity but has also compelled the Buffalo branch to speed up and augment it.

Meanwhile, the improvement in Chevrolet sales in the South and West is holding. The influence of seasonal factors is manifest in a preliminary schedule of 50,000 units for August, about 15,000 less than the start of July. If August does not better its initial schedule it will be the first month since the bank holiday to do so.

Pontiac at about 12,000 units continues its June gait. Buick and Olds each hold at about 5000, and Cadillac-LaSalle at 1000. General Motors retail sales in June were 101,827, and factory sales to dealers 99,956. July will almost equal this showing, the best since June, 1929.

The Chevrolet foundry is pouring 1500 tons of iron a day. The Saginaw malleable division of General Motors is melting over 500 tons daily.

Heading into the customary August shutdown, which now seems likely to start Aug. 19 and conclude the day after Labor day, Ford is pressing all material and parts suppliers for speedy shipments. July apparently will be a 50,000-car month for Ford, with the first three weeks of August probably turning out 25,000 to 30,000.

Ford's August vacation shutdown in recent years has afforded opportunity for retooling, and any considerable activity at Fordson next month will be accepted as a certain indication that the new light eight —model 44—will be introduced in the early fall. Occasional releases for material indicate that this model is alive and there are some reports that a number of the blocks have already been cast by a west Michigan foundry.

Ford continues to convert his inventory into cash. He has sold 10,000 tons of basic iron to the Otis Steel Co., Cleveland, which has encountered some delay in putting its second blast furnace into blast. Ford pig iron and coke also are moving to the Campbell, Wyant & Cannon foundry at Muskegon.

Bethlehem recently purchased the bulk of the scrap accumulation at Fordson and is moving it by water to Buffalo. Some spring steel also has been disposed of by Ford. It is not known, however, that any Ford raw materials have been acquired by other than Ford material or parts suppliers.

Chrysler executives look for no letdown in their activity during July and August, and September at this distance looks equally good. Deliveries on special Plymouth jobs continue several weeks delayed. The July schedule of Chrysler, like that of June, is approximately 40,000 Plymouths, 12,000 Dodges and 5000 to 7000 DeSotos and Chryslers.

The national automobile chamber of commerce estimates June production of its members at 195,178 cars and trucks, compared with 172,276 in May and 95,713 last June. Ford is not reported in these estimates. Including Ford, June production thus is indicated at about 245,000 units for all makers, compared with 218,171 in May and 183,106 in June, 1932.

CHEVROLET is now employing 36,000 men; Ford 28,000; Chrysler 42,000 in all divisions, a gain of 12,000 since June 1. Plymouth payrolls list 8000. . . . Motor Wheel Corp., Lansing, has introduced a steel beer barrel called "duo steel". . . . Murray Body will manufacture quarter as well as half keg size beer barrels. . . . Peerless, at Cleveland, has incorporated a brewing subsidiary to use part of its idle plant. . . . Receivers for Studebaker report sales of 3798 cars in April, 4120 in May and 5050 in June, with 2100 unfilled orders. . . . Willys creditors for $8,500,000 have approved a plan of reorganization, but International Harvester officials are canvassing the prospects of their having to make their own light truck. . . . Increased demand for free-wheeling devices has put the L. G. S. Devices Corp., Indianapolis, on a 24-hour day, 7-day week. June production was 90,000 units.

New Engineering Firm Builds Air-Cooled Motor

Ed. S. Marks and Carl T. Doman, Syracuse, N. Y., have formed a partnership for the purpose of developing a cross-draft air-cooled gasoline engine for land vehicle application. The firm has located at 101 Court street, Syracuse, and has engine under test. A six cylinder type under development for six months is ready for announcement. Features include practical airplane construction in the air-cooled cylinders, a powerful turbine fan that will cool the engine even at 150 degrees Fahr. air temperature, full force lubrication, oil cooler and hydraulic valve clearance compensators that keep valve clearance at zero.

The partnership has gathered a corps of engineers experienced in the automotive, industrial and aviation fields.

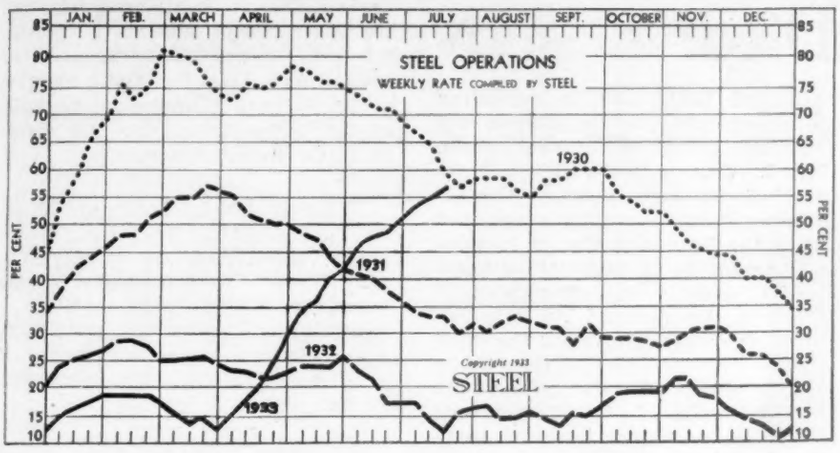
Higher Iron Average in Iron Ore Shipped in 1932

Iron ore shipped from the Lake Superior district in 1932 averaged 52.16 per cent iron natural, according to the Lake Superior Iron Ore association, Cleveland. This was the highest in ten years, the general tendency being to mine the better grades of ore when shipments are curtailed. In 1931 the average was 51.53 per cent; and in 1929, it was 51.18.

The average moisture content of the ore shipped last year was 9.92 per cent, compared with 10.84 in 1931; phosphorus was 0.099 per cent, and in 1931, 0.087 per cent; silica increased from 8.60 to 9.05 per cent; manganese was reduced from 0.8 to 0.68 per cent.

Torchweld Moves Offices

Torchweld Equipment Co., Chicago, has moved its works and offices to 1035 West Lake street, Chicago, where better facilities are offered. The company has also opened an office at 75 West Grand street, New York, in charge of R. B. Spinney.



Steel Operations Up to 57%, Equal 1930; Gain This Week

CLIMBING 2 more points to 57 per cent, steelworks operations last week virtually overtook the 1930 rate. This has been accomplished by an almost unbroken rise starting in the last week of March, the 1932 line being crossed in April, the 1931 line at the beginning of June and indications are that this week will top comparable period of 1930.

Great encouragement is derived from the fact that the major producing industries continue strong. Chicago last week gained 4 points to 60 per cent; Pittsburgh, 2 points to 48; Youngstown, 3 points to 66; and eastern Pennsylvania, 2 points to 42.

Details for various districts follow:

Chicago

Steelmaking operations have expanded further despite a moderation in new business. Heavy backlogs accumulated in June have necessitated increased schedules which are expected to be maintained without difficulty over the rest of this month. A 4-point rise in ingot production the past week brought the average to 60 per cent. Blast furnace schedules, however, are unchanged with 13 of 36 steelworks stacks and one merchant unit in blast.

Cleveland

Steelworks operations here, including Lorain, averaged 87 per cent for the week ended July 15, up 5 points. Corrigan, McKinney Steel Co. has all its 14 open hearths active, Otis Steel Co. all of its 8 and Lorain continuing with all 12 units. In addition, Otis has on three small open hearths at its Lakeside (Cleveland) plant, and purchased 10,000 tons of basic iron recently to supply immediate requirements.. Its sheet, strip and plate mills are running at capacity. Corrigan, McKinney company has its four blast furnaces in operation; Otis is preparing to light its second; and one stack at Toledo, O., is being made ready for production.

Pittsburgh

Steel ingot operations advanced to 48 per cent last week, a gain of 2 points due largely to increased production by one large interest. Six open hearths were added at one plant. One additional steelworks blast furnace was blown in here last week, Carnegie Steel Co. adding a furnace at Isabella on ferromanganese, making two operating there. There are now 21 out of 53 steelworks blast furnaces active here. Individual rates are as follows: Carnegie Steel Co., 12 out of 32 in the immediate Pittsburgh district; Jones & Laughlin Steel Corp., 6 out of 11; Pittsburgh Crucible Steel Co., one out of two at Midland, Pa.; National Tube Co. at McKeesport, one out of four; and Pittsburgh Steel Co., one out of two at Monessen. American Steel & Wire Co. is scheduled to resume one or both of its furnaces at Donora.

Eastern Pennsylvania

Steelmaking operations in the central and eastern seaboard district have advanced 2 points to 42 per cent by virtue of an increase in the number of open hearths in operation and longer working schedules. With demand for heavy finished products well sustained and likely to increase in view of pending higher prices, a further increase in operations may develop before the close of this month.

Wheeling

An unchanged rate of 90 per cent operations prevails in the Wheeling, W. Va., district. The two large producers are both operating at high rates. The current rate is unchanged from a week ago.

Buffalo

District steel works operated at 62 per cent during the week ended

Operating Rate of the Steel Industry, by Weeks

All figures except monthly open-hearth and bessemer totals of American Iron and Steel institute are percentages, based on reports from Pittsburgh, Chicago, Youngstown, eastern Pennsylvania, Cleveland, Birmingham, Buffalo, Wheeling, New England, St. Louis, Lorain, Detroit districts. Weeks end Saturday. STEEL's weekly estimates take into account only actual available capacity, which is less than Institute's total.

1932	1st Week	2nd Week	3rd Week	4th Week	5th Week	STEEL's Average	Institute's Monthly Total tons	Institute's Monthly Average
Jan.	22	25	26	27	28.5	25.7	1,484,991	26.41
Feb.	28.5	27	25	25	....	26.4	1,481,253	27.40
March	25	25.5	24.5	23	....	24.5	1,433,337	24.55
April	23	22	22	23	24	22.8	1,259,629	22.40
May	24	24	25.5	23	....	24.1	1,125,243	20.01
June	21	17	17	17	....	18.0	912,757	16.23
July	14.5	12	15.5	16.5	16.5	15.0	806,722	14.92
Aug.	14.5	14.5	15.5	14.5	....	14.7	846,730	14.50
Sept.	13.5	15.5	15	17	....	15.3	991,858	17.64
Oct.	18	19	19.5	19.5	19.5	19.1	1,087,058	19.33
Nov.	21	21	19	17.5	....	19.6	1,032,221	18.36
Dec.	16	15	14	12	13	14.0	861,034	15.31
1933								
Jan.	15.5	17	18	19	....	17.4	1,030,075	18.23
Feb.	19	19	19	17	....	18.5	1,086,867	20.83
March	15	13.5	15	14	15.5	14.6	909,886	15.50
April	17.5	20.5	25	29	....	23.0	1,362,856	25.08
May	33	36	40	43	....	38.0	2,001,991	34.11
June	47	48	49	51	54	49.8	2,597,517	45.96
July	55	57	....	....	....	....	.....	.....

July 15, this being the highest rate recorded here since June, 1931. There were the equivalent of 22 open hearths in operation in the district, with prospect that the same number would continue to produce steel this week.

Youngstown

Steel output here last week averaged 66 per cent, a gain of 4 points, and is expected to advance to 67 per cent at the beginning of this week. Fifty-seven of 83 open hearths are melting, and bessemer output is averaging 68 per cent. Orders booked in the first half of July are slightly ahead of the same period of June for most district producers.

Detroit

Steelworks operations here are more properly represented by an estimate of 55 per cent than the 38 per cent heretofore carried. The six open hearths of the Great Lakes division of the National Steel Corp., which continue in operation, have an annual capacity of 600,000 tons, compared with 520,000 tons for the ten Ford open hearths, which continue idle and whose operation appears more indefinite with the sale of the Ford accumulation of scrap. The Great Lakes active capacity thus represents about 55 per cent of the tonnage of the district.

New England

Operations here were at 85 per cent last week, with indications about the same for this week. Nine of 13 open hearths are operating.

Birmingham

A rise of 2 points puts the steel operating rate here up to 77 per cent. Tennessee Coal, Iron & Railroad Co. has 13 open hearths on at Fairfield and Ensley and Gulf States Steel Co. five on at Gadsden. The rail mill of the Tennessee company is operating.

Canada

The blooming and merchant mills of the Algoma Steel Corp., Sault Ste. Marie, Ont., have started operation following the receipt of new orders. Rail mill and a blast furnace also are being made ready to start up.

Is Mining More Coal

Youngstown Sheet & Tube Co., Youngstown, O., is producing coal at its subsidiary mines at Nemacolin, Pa., and Dehue, W. Va., at the rate of 115,000 tons monthly, compared with 25,000 tons earlier in the year. This reflects greatly increased demand for by-product coal for coking.

Died:

JOSEPH KENTSMITH, consulting metallurgist for the Climax Molybdenum Co., at Battle Creek, Mich., July 8. Coming to the United States in 1906, he participated in the development of vanadium steel, and when the Vanadium Co. of America was organized he spent three years in its laboratories. Returning to England, he engaged in research work on special alloys for the British government. During the war he was decorated with the order of the British Empire. In 1925 he returned to the United States, becoming associated with the Climax company.

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E. J. Van Pelt, 45, vice president, the American Ball Mill Co., Denver, in Philadelphia, July 1.

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R. H. Semple, 48, retired president of the American Railway Supply Co., Louisville, Ky., at Pasadena, Calif., July 6.

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William A. Calison, 55, superintendent of motive power for the Monon railroad and an authority on rail equipment and shop design, at Delphi, Ind.

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J. Alex Quay, 40, for the past 16 years with the Union Drawn Steel Co., Massillon, O., first as purchasing agent and later as manager of sales promotion, at Massillon, July 11.

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Frederick B. Lovejoy, 70, president, Wheelock-Lovejoy & Co., Cambridge, Mass., steel distributors, at his home, Montclair, N. J., July 7. Mr. Lovejoy was a native of Boston and became associated with the firm of which he was president when a young man.

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John P. Shaddick, for 25 years with the Tennessee Coal, Iron & Railroad Co. and for a number of years superintendent of the rail mill at Ensley, Ala., at Ocala, Fla., July 1. Before being connected with the Tennessee company he was employed by the Carnegie Steel Co.

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Herbert L. Flather, 58, president and treasurer, Flather Co., and treasurer, Huriburt Rogers Machinery Co., at Nashua, N. H., July 7. He was former police commissioner of that city, a director of the Second National Bank, Nashua, and active in the National Machine Tool Builders' association.

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W. Acheson Smith, 54, president, Acheson Graphite Co., Niagara Falls, N. Y., and vice president, National Carbon Co., at Baltimore, July 12. He was a son of William H. Smith, for many years chief engineer of the Carnegie Steel Co., and a nephew of Dr. Edward G. Acheson, founder of the Carborundum Co. He resided in Greenwich, Conn.

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Frank N. MacLeod, 67, president, Abrasive Machine Tool Co., Providence, R. I., June 25 at Harwichport, Mass. He was formerly vice president of the National Machine Tool Builders' association, and for 25 years was assistant sales manager of the Brown & Sharpe Mfg. Co., Providence.

Financial News of Steel Industry

American Rolling Mill Co., Middletown, O., will refund its 4½ per cent notes due Nov. 1, 1933, with 5 per cent convertible notes, each $1000 note being convertible into 40 shares of common stock. These new notes will be callable at various prices from $103 in 1934 to $101 in 1938.

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Central Tube Co., Pittsburgh, has declared a dividend of 10 cents a share payable July 20 to record July 10.

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Canadian Locomotive Co. Ltd., Kingston, Ont., has been relisted on various Canadian stock exchanges and expects to benefit from the improvement in the position of Canadian railroads.

Canadian 1932 Output of Iron, Steel $249,699,658

Preliminary figures compiled by the dominion bureau of statistics indicate that production of iron and steel and their manufactures in Canada was valued at $249,699,658 in 1932, compared with $374,725,068 in 1931.

The principal declines by industries in million of dollars were as follows: Railway rolling stock fell from $67.86 to $40.87; primary iron and steel from $36.9 to $16.19; automobiles from $43.8 to $59.67; castings and forgings to $35.89 from $51.45; bridges, buildings and structural steel work to $7.4 from $22.17; sheet metal products to $29.66 from $39.0; machinery to $27.2 from $34.49; agricultural implements to $6.0 from $11.17; wire and wire goods to $11.0 from $14.19; auto parts and accessories to $9.99 from $12.6; and hardware and tools to $11.79 from $13.37.

Industrial Men in the Day's News

Clarence C. Dodge, President, American Steel Warehouse Association

LONG an influential figure in the improvement of steel warehouse distribution facilities in New England.

FORTY years with one company, he advanced from shop boy to treasurer and general manager.

A NATIVE of Rutland, Mass., he also is interested in various manufacturing enterprises in that state.

FORTY years with the same steel warehouse organization, Clarence C. Dodge rose steadily from a lad in the shop to treasurer and general manager of George F. Blake Inc., Worcester, Mass., one of the oldest and leading jobbers in Central New England.

Active, also, in the affairs of the American Steel Warehouse association since 1914. Mr. Dodge was elected president at the association's annual meeting in New York, May 23-24. Prior to this recognition he served as vice president, and has been a powerful influence in the progressive improvement in steel warehouse distribution in New England.

A native of Rutland, Mass., just outside Worcester, Mr. Dodge attended the schools of that town and after graduating from Worcester academy entered the employe of George F. Blake Jr. & Co. as a handy lad in the shop and office. He was 16 years old. His entire business life has been in association with the Blake organization.

After a thorough training in the warehouse, Mr. Blake became one of the best known salesmen in the New England district. His progress was steady, and in 1914 he became the company's general manager. Mr. Blake died in 1928, and it was reorganized and incorporated, Mr. Dodge becoming treasurer and general manager.

Mr. Dodge also is president of the New England Heavy Hardware association and has been chairman of the heavy hardware committee of association since 1916. He is a director of Stevens-Walden Inc., Worcester, maker of wrenches and other small tools. He is vice president and assistant treasurer, Eastman Bridge Co., Worcester structural steel fabricator, and a director of the Worcester Cold Storage Co.

Mr. Dodge is a member of several fraternal organizations at Worcester, the Worcester club and the Worcester Country club. He is married, has one daughter and two grandchildren.

JOHN S. ANDREWS, for the past ten years associated with the Republic Steel Corp. and its predecessors, has resigned to take charge of sales for the Rotary Electric Steel Co. (Michigan), now completing a plant in Detroit for the production of cold-finished steel bars of standard analysis by the new rotary method.

Mr. Andrews began his career in steel in the Detroit office of the Union Drawn Steel Co. Then he entered the Detroit office of the Central Steel Co., later the Central Alloy Steel Corp., going to the Massillon, O., office in 1928 as assistant manager of sales in the sheet and strip division.

Two years later he was transferred to the Youngstown, O., office to take charge of sales of high-finished sheets. In 1931 he returned to the Detroit office of Republic, handling all products.

Production, at 7500 to 10,000 tons a month, is expected to be started by the Rotary company about Sept. 1. H. M. Naugle, president, and A. J. Townsend, vice president and general manager of the Rotary company, were the initial producers of wide strip in this country.

L. F. Lottier, formerly with the Air Reduction Sales Co., has joined the metallurgical staff of the Rotary company.

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E. P. Barnes, president of the St. Louis Welding society, has resigned as supervisor of welding for the Moloney Electric Co., St. Louis, to become associated with the Modern Engineering Co., 3411 Pine boulevard, St. Louis, concentrating on the sales and service in connection with welding equipment and supplies offered by that company, including products of the Hobart Bros. Co., Troy, O. Mr. Barnes has had 21 years experience in welding by both gas and electric methods.

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Edward P. Trout, formerly sales manager in California for Lufkin Foundry & Machine Co., Lufkin, Tex., has been placed in charge of the com-

(*Please turn to Page* 56)

EDITORIAL

Industry Seeks a Definite Statement of NIRA Policy

IT is unfortunate, although probably inevitable, that arguments relative to the national industrial recovery act have reached the stage of threat and recrimination. During the past ten days a number of representatives have used strong and alarming language in warning industry what would happen if codes were not presented more promptly. One official identified with the recovery administration went so far as to say that complete control of industry by political agencies would be necessary if industrial leaders did not quickly show a more co-operative spirit.

Prior to this pronouncement, numerous representatives of the so-called "social-minded" school in Washington were utilizing every opportunity to tell the public that the ultimate purpose of the recently enacted emergency legislation is to impose a new social concept of government upon the nation. They have intimated that the present emergency is an opportune occasion for conducting a great experiment in planned economy. The nation would be the laboratory, theorists would be the experimenters and, as one company president said, industries would take the role of the white mice and guinea pigs.

Executives Show Caution Under Barrage Of Widespread Hostile Attacks

While this barrage of boasts and threats was being fired over the head of industry, enthusiastic union labor leaders were beating the drums to stir up a general attack against open-shop industries. At the same time, occasional utterances from several responsible officials of the Roosevelt administration indicated a deep sympathy with union labor and open ridicule of the rights of industry.

In view of these hostile attacks from so many official and semi-official sources, is it any wonder that here and there industrial executives displayed signs of uneasiness over the trend of developments in connection with the emergency legislation? Would any group in America, charged with responsibilities to employes, stockholders and the public as are the executives of industrial companies, listen to such a bombardment of invective without feeling that it should proceed cautiously?

Leaders of industry who have been trying conscientiously to co-operate in the national recovery program have a right to question the motives of those responsible for these ill-advised threats. Also they have grounds for wondering how far the Roosevelt administration will go in sanctioning the evident aims of the social theorists. A clear-cut statement of what sacrifices are expected of industry would help to clear away much of the doubt which unquestionably prevails throughout the business world.

If President Roosevelt could or would give some assurance as to how far this recovery experiment will be carried—if some limits could be set so that industry might be able to count the cost, then it would be possible for industry to arrive at an intelligent decision of policy, and to differentiate between an attitude of reluctant sufferance or enthusiastic co-operation.

Unscrupulous Minority Partly To Blame For Hindering Constructive Forces

It would be unfair, in this discussion, to imply that industry is blameless in the discord which has arisen. Unfortunately, a number of companies have seized upon the present opportunity to manufacture goods for stock, employing labor long hours and at low wages in an eleventh-hour attempt to gain every possible advantage before the codes become effective.

These and other sharp practices on the part of a minority probably are responsible in some measure for the threats and invectives. It is certain that they are responsible for the proposal, apparently supported by the administration, that a blanket schedule of hours and wages be imposed throughout all industries until codes for each group are adopted. This measure, while certain to injure some innocent companies and to leave some offenders untouched, probably is much to be preferred to many of the alternatives which have been threatened.

It is a pity that the constructive forces now at work are obliged to contend with the bombast, boasts, threats and back-biting indulged in by fanatical theorists, selfish factions and unscrupulous minorities.

If more of the talking can be done by responsible, experienced officials of government and leaders of industry, the path of the national industrial recovery administration will be made smoother.

THE BUSINESS TREND

Steel Output at 68 Per Cent Of Pre-depression Levels

WHILE everyone in the steel industry is aware of the phenomenal comeback in steelworks' operations since the secondary low point in March, few realize how favorably current steel ingot output compares with the best records of pre-depression years.

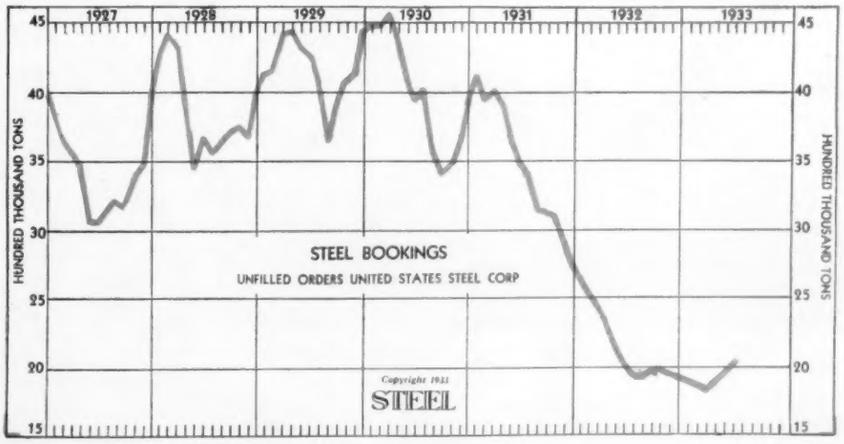
Steel production in the five years from 1925 to 1929, inclusive, was at a relatively high rate compared with any other period of five consecutive years. In 1928 and 1929 output rose to the highest points attained in the history of the industry.

The average production of steel ingots in June in the five years was 3,816,214 tons. The American Iron and Steel institute's calculated monthly output for June, 1933, was 2,597,517 tons. This figures out at 68 per cent of the 5-year June average, which, it must be admitted, is a surprisingly high percentage of the average for the Junes of banner years.

Freight car loadings continue to improve steadily. Volume in the week ending July 1 totaled 634,074 cars, this being the second week in which the total exceeded 600,000. The curve of car loadings since early in May is almost identical in amount and direction with that beginning in August, 1932. The lapse in the week including Decoration day, 1933, corresponds in depth with that of Labor day week, 1932, and the subsequent sharp rises are similar. However, the parallel will be destroyed by mid-July, inasmuch as loadings broke sharply in the middle of last October.

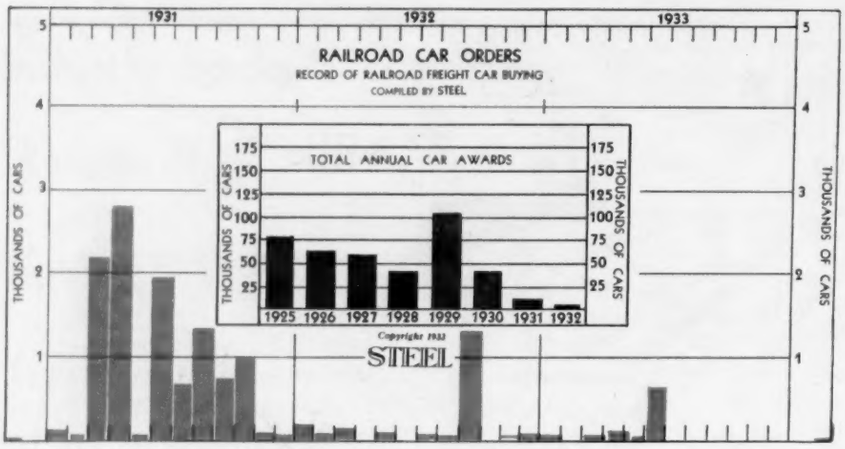
Backlog of Steel Corporation Bookings Gains By Greater Margin Than Was Expected

Unfilled orders of the United States Steel Corp. on June 30 again were above the 2,000,000-ton mark after wavering for about a year at lower levels. Eagerness of customers to book orders before third-quarter prices were announced may have been a factor in the gain of 176,856 tons, which was sharply in excess of expectations.



1933 Million Tons	
June	2,106
May	1,929
April	1,864
March	1,841
Feb.	1,854
Jan.	1,898

1932 Million Tons	
June	2,034
May	2,177
April	2,326
March	2,472
Feb.	2,545
Jan.	2,648



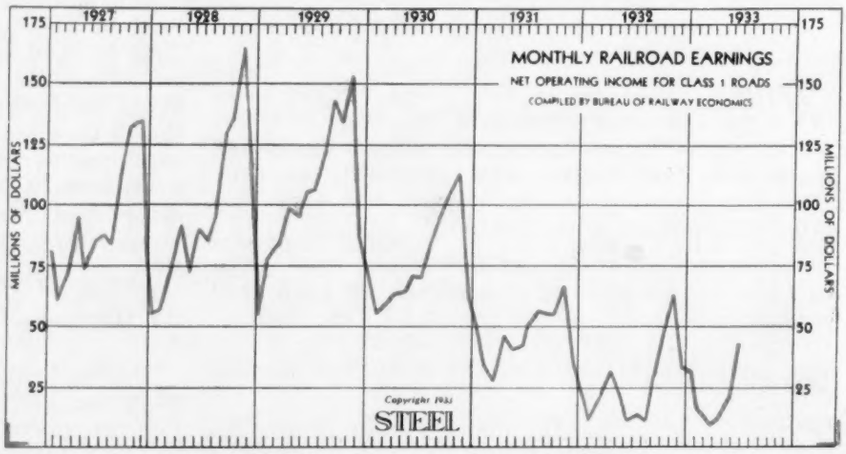
June, 1933	500
May, 1933	8
June, 1932	0

June Car Awards Show Large Increase

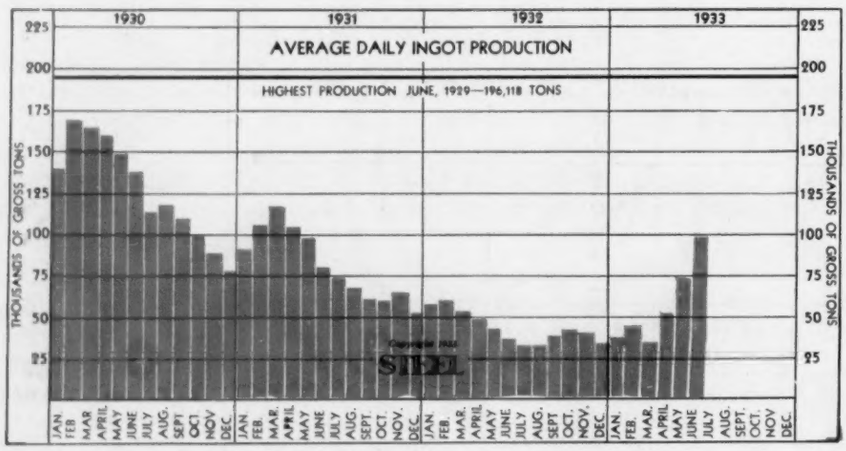
Awarding of 500 domestic freight cars in June by the Chicago Great Western brought the total for the first half of this year to 566 cars. This is the first sizable equipment order since the Pennsylvania's award of 1285 box cars in September, 1932, which were built in their own shops. There were no orders for freight cars in June last year, while for the corresponding month in 1931 awards totaled 1910 cars.

Railway Earnings Up Sharply in May

Class 1 railroads of the United States for May had a net operating income of $40,693,072, which was at the annual rate of return of 2.04 per cent on their property investment. This is a remarkable improvement over the $11,665,702 earned in May last year, and with continued traffic gains and the strict control maintained over operating expenses, it appears that the earnings of most of the carriers will be much improved during the summer months.



May, 1933	$40,693,072
April, 1933	19,041,489
May, 1932	11,665,702



June, 1933	99,904
May, 1933	74,148
June, 1932	35,106

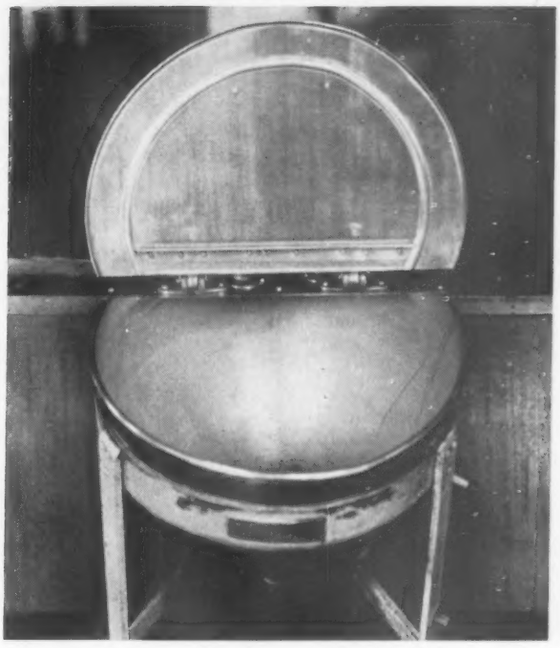
June Ingot Output Highest Since April, 1931

Output of steel ingots in June was at the rate of 99,904 gross tons per day, the highest rate since April, 1931, when 106,421 tons per day was produced. The June rate was 34 per cent greater than that of May, when it was 74,148 tons. According to statistics compiled by the American Iron and Steel institute, total calculated output for the first six months of this year is 8,989,192 gross tons compared with 7,697,210 tons for the same period in 1932.

Is Service of 18-8 Forecast by Copper Sulphate Test?

BY V. B. BROWNE

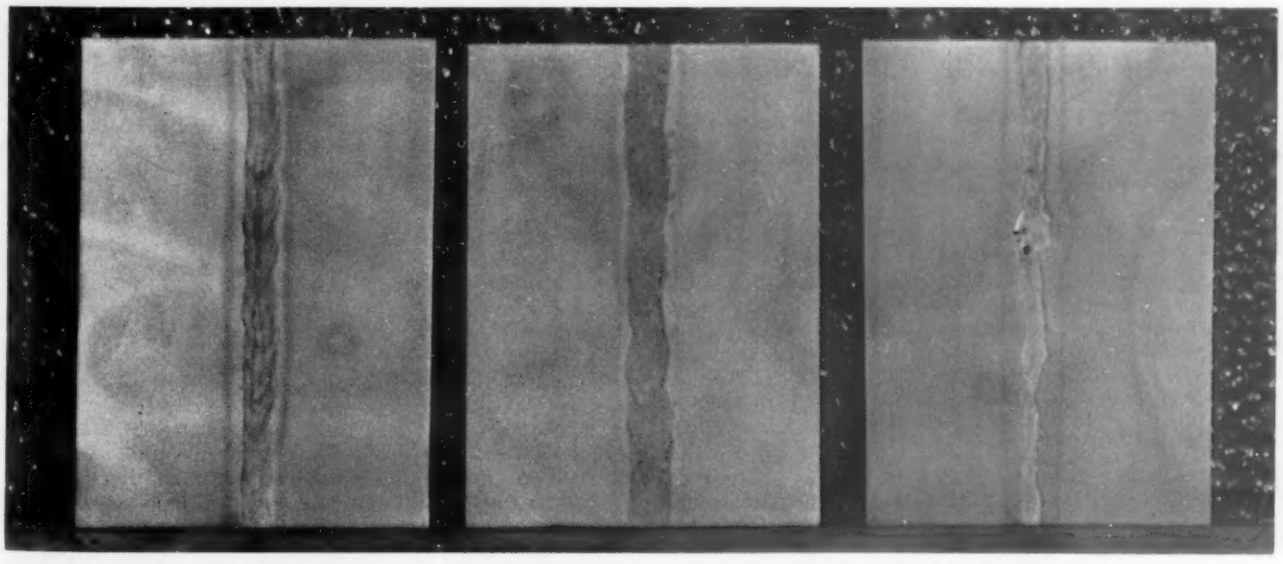
Vice President in Charge of Research,
Allegheny Steel Co.



This steam-jacketed kettle, made from high-carbon 18-8 steel, oxyacetylene welded and unannealed, has been used two years in restaurant and food preserving service, including boiling vinegar and salt solutions. It would disintegrate in 10 minutes in Krupp sulphuric acid-copper sulphate reagent

ENGINEERS and metallurgists have searched for some single accelerated test which might be used as a fairly accurate measure of relative corrosion resistance of various metals under normal commercial service, but so far no test has been worked out. One must conclude that each accelerated test indicates nothing more than that which is likely to occur in service when that metal is subjected to the action of that particular or similar medium under identical conditions. Even a slight change in these conditions, as for example, temperature or concentration, is likely to give an entirely different result.

With metals of high resistance to corrosion, the problem becomes increasingly difficult. Chrome and chrome-nickel steels, classified as "stainless" steels, are exceedingly resistant to ordinary corrosive media encountered in service, and no accelerated test has yet been devised which will forecast what will happen ex-

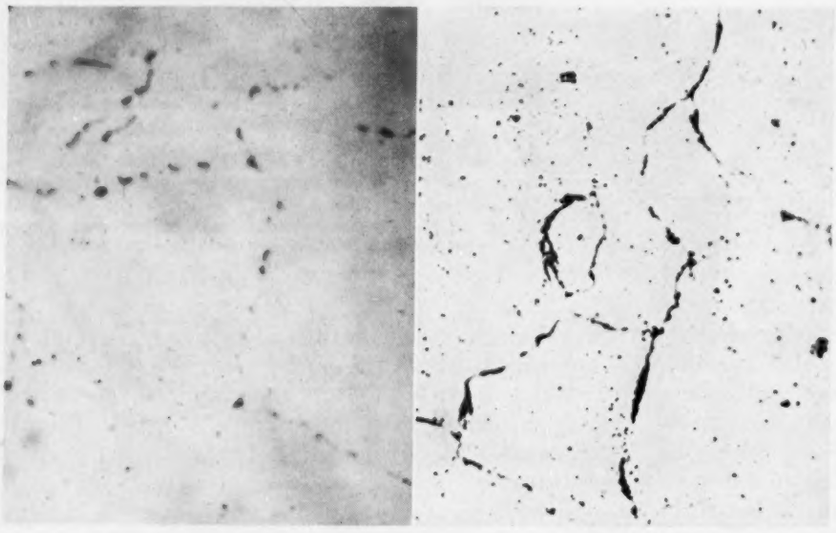


0.063	Carbon	8.96	Nickel	0.075	Carbon	19.12	Chromium	0.086	Carbon	8.09	Nickel
17.10	Chromium	0.36	Titanium			9.17	Nickel	17.25	Chromium	0.35	Columbium

Specimens of welded stainless steel showing lines adjacent to the weld produced by immersion in boiling nitric acid. All three would stand up indefinitely in the Krupp reagent without disintegration

cept when conditions of service are identical to conditions in the test, or when results of the test have been standardized with some given service.

For example, the Brearley copper-sulphate test, designed to test stainless cutlery, and used by Brearley as a definition of the word "stainless," only indicates that if this steel, when hardened, tempered and polished, does not become plated with copper when immersed in the solution, it is reasonably safe to assume that the cutlery can be used for domestic service specifically to resist action of fruit juices and vinegar. It does not indicate, however, that the material is stainless, as defined in the dictionary; as a matter of fact, stainless steel which conforms to all the requirements of cutlery tests, will stain and rust badly under many conditions of service.



Photomicrographs at about 700 diameters of 18-8 austenitic steel containing 0.052 carbon, 18.37 chromium and 9.18 per cent nickel. The specimen at the left was heated 288 hours at 1200 degrees Fahr. and failed after 21 hours in Krupp reagent. The specimen at the right was heated 500 hours at the same temperature and showed no failure after 200 hours in the reagent

Of all the stainless steels the most resistant to corrosion is the austenitic chrome-nickel type containing approximately 18 per cent chromium and 8 per cent nickel. When this steel was developed and processes worked out for its manufacture and fabrication, it was hoped that it would solve most corrosion problems. It was practically untarnishable under ordinary service, and was soluble only in certain mineral acids and some of their compounds.

Carbide Precipitation Occurs

It developed, however, that this metal was susceptible to a disease which under certain conditions impaired its resistance to corrosion. This disease was encountered when the material was used in a temperature range of from 800 to 1500 degrees Fahr. and subjected to an active corrosive agent. Even when the metal was merely heated to a temperature within this range and afterward subjected to corrosive conditions when cold, it would be affected to a point where failure of the specimen frequently occurred.

The change occurring when this steel is heated within this temperature range is a structural one. Austenite is a solid solution of iron and carbon. It is nonmagnetic and unstable in low-carbon steels except at temperatures above 1750 degrees Fahr. It exists only when the steel is maintained at high temperatures, and as soon as cooling takes place this constituent breaks up or dissociates into two constituents, iron carbide and ferrite. When certain elements are added to the iron and carbon alloy, the stability of this constituent is increased considerably; for example, when chromium and nickel are added to the extent of 18 and 8 per cent, respectively, the alloy is rendered stable enough that if cooled rapidly the austenite persists to ordinary temperatures, but if cooled slowly or heated to a temperature within the range of 800 to 1500 degrees Fahr. dissociation will take place, and the carbide will be precipitated, usually between the grain boundaries.

When this happens, subsequent heating to above the dissociation temperature followed by rapid cooling will again render the alloy completely austenitic. It is this dissociation of austenite into ferrite and a carbide that causes the disease. The extent to which dissociation occurs is governed by time and temperature of heating, and to a limited extent by composition. Composition modifications only affect the time element by retarding dissociation and, therefore, modifications have a distinctly restricted value.

Irrespective of composition, this material when heated long enough within the 800-1500 degree range, will dissociate and the disease will develop if the metal is in contact with a corrosive agent sufficiently active to produce it. This disease, termed intercrystalline embrittlement, manifests itself either by formation of cracks along the crystal boundaries, or in severe cases by complete disintegration in which the intergranular constituent is destroyed or dissolved, and the crystals fall apart as a powder. This disease rarely occurs unless the material is heated within the above range, or cooled slowly from above the range.

Unfortunately, in fabrication of many articles, it is not only necessary but desirable to weld, which involves heating the area contiguous to the weld to temperatures within this range. Equipment so fabricated will develop this disease when the metal in service is in contact with an active corrosive medium.

Does Not Always Develop

Precipitation of carbide between the grain boundaries does not necessarily mean that the disease will develop in all cases. As a matter of fact, this phenomenon increases the tensile strength of the metal, and only slightly decreases ductility and impact value. In many forms of commercial application the materials with which the metal is in contact are not sufficiently corrosive, or sufficiently concentrated to produce the disease.

When the service is known to be of a highly corrosive nature, however, and particularly where experience has indicated that this disease will occur, it is necessary to anneal the welded equipment, or this being impossible to take advantage of the limited value which a modification of composition will give. By suitably modifying the composition, dissociation of the austenite will be so retarded that in the short period required for welding, there will not be sufficient time to permit carbide precipitation to the extent producing intercrystalline corrosion.

It was logical that the first attempt to modify the composition of this alloy would be to reduce carbon content. This was done at the Krupp works in Germany, and based on certain laboratory tests it was at first recommended that to prevent the occurence of this disease, especially in welded equipment which could not be annealed, it was simply necessary to keep the carbon of the alloy below 0.07 per cent. Subsequent laboratory tests and results of service showed, however, that even with the carbon below 0.07 this alloy still was susceptible to carbide precipitation if held sufficiently long in the dissociation temperature range, and it was found also that if the chromium and

nickel were low the alloy was as susceptible as if the carbon content were considerably higher with normal percentages of chromium and nickel.

Further research by a number of metallurgists indicated that this phenomenon could be completely eliminated only by reducing the carbon content to less than 0.02 per cent, but when this was done the alloy did not have the properties of an alloy of the same composition which was austenitic on account of its high carbon content. Other modifications were recommended such as addition of titanium, vanadium, tungsten, columbium, etc., all of which undoubtedly sufficiently retard the dissociation if the carbon content is kept relatively low to permit their safe use for many applications at normal temperatures after welding. With higher carbon content, addition of practically all of these elements is of doubtful value.

Possible To Retard Action

It was found also that if the relationship between carbon and iron content is adjusted rationally dissociation would be retarded to such an extent that the alloys could be welded safely. Nevertheless, all these modifications ultimately would dissociate if heated long enough within the range of 800 to 1500 degrees Fahr., and in most cases addition of elements other than chromium and nickel have the effect of decreasing corrosion resistance seriously. While there are a number of elements which if added to this alloy influence the rate of dissociation and perhaps also the form and composition of the constituent which is precipitated between the grain boundaries, it is the writer's experience that columbium is the only element which apparently accomplishes the purpose without seriously affecting the inherent corrosion-resistant qualities.

It must be borne in mind, however, that all conclusions arrived at have been based on results obtained on a certain specific accelerated test introduced by the Krupp laboratories, consisting in boiling the alloy heated for various periods at some temperature within the range of dissociation in a solution containing 10 per cent sulphuric acid and 10 per cent copper sulphate. Under this test alloys subjected to temperatures of dissociation will either completely disintegrate in a short period, lose their metallic ring, or be unaffected depending on the composition and time of heating.

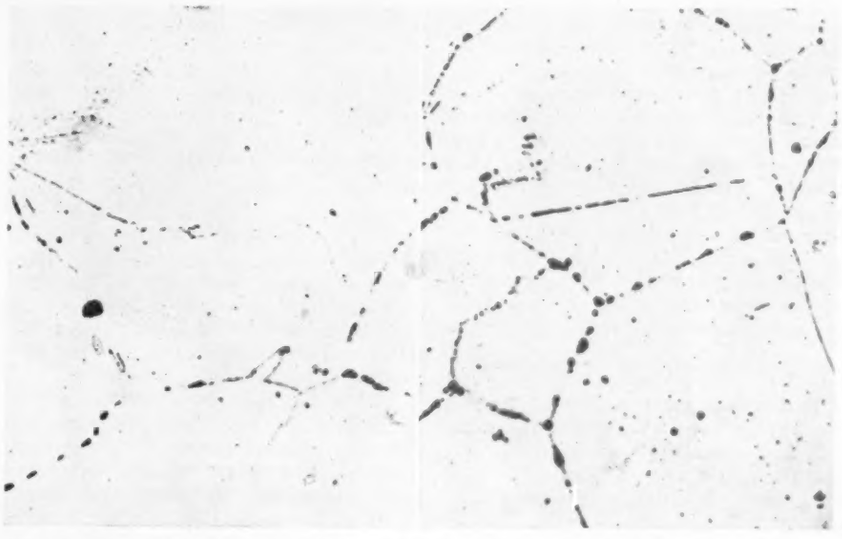
To the writer it seems that one is not justified in accepting results of this test as a measure of what may happen in service, especially since it can be shown that samples unaffected by this particular solution will be affected seriously by other accelerated tests such as boiling concentrated nitric acid. It can be shown also that even the most stable alloys having extremely low carbon and those with columbium, titanium and vanadium, which have given the best results as measured by the sulphuric-copper sulphate test, will when welded show a distinct line of weakness at the area next to the weld if they are subjected to certain selective corrosive influences such as ferric chloride, and certain combinations of mixed acids.

It appears, therefore, that in spite of results obtained by this generally accepted accelerated test adopted by the Krupp laboratories, "incipient" dissociation does take place when even the most stable alloy is welded and can be detected by the use of some other method of testing, even though presence of precipitated carbide cannot be established by the usual microscopic examination.

A study of manifestations of this accelerated test reveals the fact that the results of the tests are due entirely to electrolytic action brought about by differences of potential, and can be varied measurably by slight modifications in concentration, or by changes in composition and structure of the alloy. For example, if high-carbon 18-8 alloy is heated to 1200 degrees Fahr. for a short time and then subjected to this test, it will disintegrate rapidly. If the same alloy is heated to 1550 degrees Fahr. for a short time and subjected to this solution it is unaffected.

Microscopic examination of the two samples, however, will show that the one heated to the higher temperature contains a much greater amount of precipitated carbide than the one heated to the lower temperature. Similarly, if we prolong the heating at 1200 degrees Fahr. to 400 to 500 hours, the sample may be only slightly affected and in many cases not affected at all. Yet the microscope will show a much greater amount of precipitated carbide in the sample heated for a long time than in the one heated for a short time.

It is apparent that under different conditions of heating the precipitated constituent assumes modifications changing its electric potential, and a corresponding change is obtained in the results in this particular electrolyte—boiling sulphuric acid and copper sulphate. It does not necessarily follow, however, that the same results will be obtained if some other electrolyte were used, as can be shown, nor does it prove that the same results will be obtained when the metal is used for some other purpose.



Photomicrographs at about 700 *diameters of* 18-8 *austenitic steel containing* 0.10 *carbon,* 18.33 *chromium and* 7.98 *per cent nickel. The specimen at the left was heated* 68 *hours at* 1550 *degrees Fahr. and showed no failure after* 200 *hours in Krupp reagent. The specimen at the left was heated* 1550 *degrees Fahr. for* 68 *hours and* 1200 *degrees for* 1 *hour—it failed after* 50 *hours in the reagent*

For example, it is well known that when cyanide solutions are used, the difference in potential between certain metals is not the same as when sulphate solutions are used. In fact, the position of certain metals in this electrochemical series is changed when the series is determined by using other electrolytes. Use of this fact is made in the separation, by electrolysis, of various metals in solution, and by use of certain electrolytes, the potential between different metals can be brought close enough together so that the metals will deposit simultaneously.

Potential Is Factor

Again in electroplating copper on steel or iron, the difference in potential between the two metals is so great in sulphate solutions that a loose, coarse deposit is obtained which is valueless as a plate. Cyanide solutions invariably are used to plate copper on iron or steel because the

difference in potential is much less than in sulphate solutions and a fine adherent deposit is obtained. One cannot expect to find that the corrosive influence of beer would be parallel to that of the so-called Krupp reagent, and therefore why should one use the results obtained by this reagent to forecast what will happen to a welded beer barrel?

Thus, it must be recognized that results of this particular accelerated corrosion test can be used only as a relative indication of the extent to which a change has occurred in the structure of the alloy, which may or may not affect its ultimate value in service, and the results must be considered only from a standpoint of relativity. It might be said that by this test one is able to measure certain changes of high magnitude in the structure of the metal, brought about by time and temperature, but one is not able to measure changes of low magnitude which are brought about by the same condition. The change which occurs by heating this alloy at a temperature of 1200 degrees Fahr. for a relatively short time, say 1 hour, is as measured by this test apparently of a much higher magnitude than the change which occurs when the alloy is heated to the same temperature for 1000 hours.

Not Universally Applicable

It does not matter by what theory we explain the existing difference, the fact remains that this test will identify the change occurring in one case, and fail to identify it in the other. If, therefore, the service to which the alloy is to be put involves prolonged heating within the range of dissociation one is not warranted in using the results of the test to forecast what will happen in service, even if conditions are almost identical, because as shown the results of the test are contradictory under varied conditions of time and temperature. If would be still more ridiculous to accept the result of this test as indicative of what will happen in service involving corrosive influences not analogous to those of the sulphuric-acid copper-sulphate solution.

On the other hand, if we use this test to determine whether the short cycle of heating taking place in welding has produced a change in the alloy sufficient to be manifested by this test, it is possible to accept this manifestation as a forecast of what will happen to the alloy in service, which in the majority of cases involves a less active corrosive agent, providing the service does not also involve prolonged heating within the range of 800 to 1500 degrees Fahr.

Any 18-8 alloy, irrespective of modification in composition, which when welded and subjected to this test does not disintegrate at the area adjacent to the weld, can be considered reasonably safe for most applications. However, results obtained by this test on material subjected to long exposure to temperatures between 800 to 1500 degrees Fahr. should not be used to determine the influence of the tempering treatment occurring during welding.

Modern methods of electric welding, such as line or high-speed continuous spot welding under water, make it possible to weld 18-8 so rapidly that no tempering effect takes place. With this method of welding, composition is relatively unimportant. When experience can be used as a guide, and when laboratory tests duplicating service conditions indicate, it may be found necessary to anneal even the most stable composition after welding. For example, none of the so-called stable compositions including titanium or columbium bearing alloys, and also those alloys which have been "stabilized," can be used for hot concentrated nitric acid, unless welding is following by a final anneal.

Shows High Loss in Nitric Acid

The columbium-bearing alloy, which perhaps is the most stable of all as measured by the Krupp reagent in conjunction with long-time thermal exposures, will show at the area adjacent to the weld a loss of 5 to 10 times higher than that shown o the original material in hot concentrated nitric acid.

In conclusion, the writer points out that the results obtained by the sulphuric acid-copper sulphate test can be used in conjunction with service experience to great advantage in predicting what may occur in service, particularly when the service is at normal temperatures and welding is involved, and the test has been made on samples which have been subjected for a short time only to temperatures in the carbide dissociation range. Even under these conditions, it must not be assumed because failure does not occur in this reagent that no dissociation has resulted, for in many cases other active corroding agents show a distinct line of attack adjacent to the weld. The amount of dissociation, however, may not be great enough to prove harmful, with less active corroding agents.

When we are dealing with high temperature service in the dissociation range under corrosive conditions, where the time of exposure is long, then the results of the sulphuric acid-copper sulphate tests become of doubtful value. Because differences in potential in the various parts of the alloy have been entirely eliminated, or so reduced that the Krupp reagent fails to produce disintegration, it is no criterion that intercrystalline corrosion will not occur, when this alloy is subjected simultaneously to temperatures in the dissociation range and active corroding agents.

It is not the writer's intent to disparage any accelerated test which is applied intelligently and standardized against known service conditions, but to point out that indiscriminate use of an accelerated test is likely to prove more harmful than beneficial. There have been thousands of welded installations, particularly in the dairy, architectural, food and automobile industries, where service has been entirely satisfactory, even though the 18-8 alloy would have disintegrated in the Krupp reagent.

British Foundry Institute Meets

WITH its president-elect a foundry proprietor and one of the leading industrialists of South Wales, the Institute of British Foundrymen held its thirtieth annual meeting, June 20-23, in Cardiff. At the opening session, Victor Stobie, the retiring president, installed C. Edward Williams, chairman of John Williams & Sons Ltd., Cardiff, as his successor.

Others installed in office were Roy W. Stubbs, Joseph Stubbs Ltd., Manchester, senior vice president, and J. E. Hurst, Sheepbridge Stokes Centrifugal Castings Ltd., Chesterfield, junior vice president.

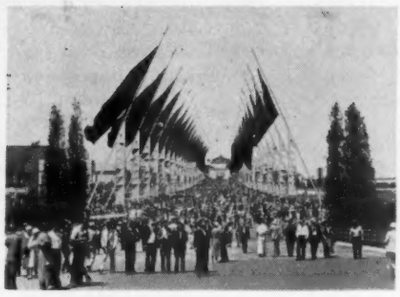
Medals Are Awarded

Retiring President Stobie presented the Oliver Stubbs medal to J. W. Gardom in recognition of outstanding work during the past year in the interests of the institute, particularly as convenor of the technical committee. A new award, made for the first time this year, for meritorious service on the part of a member over a number of years was presented to F. W. Finch, who is 87 years of age and one of the founders of the institute in 1904.

In his presidential address, Mr. Williams reviewed the origin, development and progress of the foundry industry since the early ages, emphasizing that without the art of founding, civilization would not have reached its present state. Referring to later stages of development, the speaker said the foundrymen is now pushing open the door to a new age, the Aluminum Age, in which aluminum and its alloys are effecting remarkable reduction of weight.

A review of developments of alloy cast irons in the United States and Canada in recent years, with their properties and applications, comprised the exchange paper of the American Foundrymen's association, prepared by F. B. Coyle, research metallurgist, International Nickel Co. Inc., New York, and presented in abstract by Vincent Delport, European manager of STEEL, London, and European representative of the American foundry organization.

Seen



at A

CENTURY OF PROGRESS

THE interesting Avenue of Flags which meets the visitor at the northerly entrance of the World's fair grounds is lined with 46 large flag-bearing standards. These standards are of all-welded steel construction and required 136 tons of plates and channels and 29 tons of pipe in their fabrication. Side bracing is provided by 6000 feet of ½-inch steel cable. The main supporting member of each standard is 50-feet high, rectangular in section, and is made of channels and plates. Side plates are triangular in shape, rather than solid pieces.

Inclined at an angle from the vertical support are the back bracing and the flag pole. The latter is made of tubular sections, 7, 5, 4½ and 3½-inches in diameter, pinned and welded, with the largest section fitted 6 feet into the supports where it is bolted in place. The pole tip measures 95 feet from the ground. Bolted to a concrete foundation and braced by the cable against side sway, the standards are designed to withstand wind pressure of 100 miles an hour. Already they have been subjected to a 70-mile gale. Gage Structural Steel Co., Chicago, was the fabricator on this work.

♦ ♦ ♦

Visitors to the fair are finding much of interest in the Good Housekeeping Stran Steel model house, the entire exterior being scrubable cream-colored porcelain enamel fused on iron sheets. The enameled iron is backed with Hay-

dite and cork concrete to form Glas-iron Macotta, a product of Maul Ma cotta Corp., Detroit.

The units are put in place easily much like stone or brick, forming an extremely substantial wall. The enamel is a stainless variety, a product of the Porcelain Enamel & Mfg. Co., Baltimore. To guard against corrosion, the units are edged with 18-8 stainless steel. Republic Steel Corp., Youngstown supplied both the stainless steel and the enameling iron stock.

Although the design is slightly modernistic in conception, comfort and convenience have been emphasized throughout. Principal details in the construction of this house were presented in the April 3 issue of STEEL.

♦ ♦ ♦

Attendance for the first month, May 27 to June 27, at A Century of Progress was 2,464,413. For two weeks after the opening the attendance averaged 60,000 a day. The third week the average jumped to 81,000 a day and the fourth week it went to 112,251 a day.

In its first month, the Chicago World's Fair of 1893 had 1,050,000 paid admissions.

The biggest day in the first month of the present Fair was June 23, Finnish Day of Scandinavian week, with 139,452. Next was June 18, featured by the Kiwanis International assembly, with 132,490. Visitors' registration book in the Sears-Roebuck building on June 25 had more than 150,000 entries, including visitors from 64 foreign countries and registrations from every state in the United States and every province in Canada.

♦ ♦ ♦

Inland Steel Co.'s exhibit makes use for the first time of a new type of mural. Mill scenes are reproduced on sections of flat-rolled steel by carving rather than by etching. Sand blasting accomplished the carving, and the steel is in its natural state as it comes from the mill. Indirect lighting illuminates and animates the views of various stages of steel production.

♦ ♦ ♦

The Porcelain Enamel Parade, sponsored by the Porcelain Enamel Institute Inc., Chicago, includes exhibits by more than 40 companies manufacturing porcelain enameled products or material and equipment used in porcelain enameling work. Included in this list are the American Rolling Mill Co., Ferro Enamel Corp., General Electric Co., Geuder, Paeschke & Frey Co., Graybar Electric Co., Grigsby-Grunow Co., National Enameling & Stamping Co., Newport Rolling Mill Co., Pangborn Corp., Republic Steel Corp., Titanium Alloy Mfg. Co. and United States Stamping Co. Pangborn Corp. illustrates the process of cleaning castings prior to enameling. Enameling furnaces are in operation at one display where the visitor may purchase an enameled ash tray of his own design.

♦ ♦ ♦

A report by 19 Chicago structural fabricators shows that they furnished 18,700 tons of steel for 110 projects at the fair. The Sky Ride heads the list with 3300 tons, including cable,

and the Travel and Transport building is second with 2500 tons. The Sky Ride has proved a popular attraction, drawing about 13 per cent of total attendance at the fair to the ride across the lagoon and to its two observatories atop the 628-foot towers.

♦ ♦ ♦

National industrial associations figure largely among the exhibitors at the exposition. The crowds which gather around exhibits showing the range of an industry's operations are evidence of the effectiveness of these co-operative educational displays.

Sixty-three different industries and technical organizations have joined in collective exhibits, including gas, safety glass, lumber, paper, petroleum, cooperage, chilled car wheels, livestock and meat, poultry, dairy, brick, copper and brass, electric power, diamonds, terrazzo and mosaic, life insurance, railway and others—the list comprising the background of national industry.

Science is represented by 14 association exhibits in connection with the noncommercial basic sciences educational exhibits in the Hall of Science.

IMPROVING OPEN-HEARTH FURNACE DESIGN

BY WILLIAM C. BUELL JR

Part VI—Open-Hearth Furnace Ends

(Forty-First Article of Series)

CERTAIN data relating to the 13½ and 18-inch bare and insulated roofs as applied to furnace ends, are listed in Table LXX. The economics are based on a total of 540 square feet of roof being used at the two ends. The average inner surface temperature of the silica brick is taken as 2500 degrees Fahr., and costs of brickwork and emitted heat have been developed from similar data previously used. Temperature gradients have been found in accordance with previous methods.

Assuming the life of the 18-inch roof to be no greater than that of the 13½-inch roof it will be seen that an added capital cost of only $840 as between the 13½-inch bare and the 18-inch insulated roof will effect a saving of radiated heat alone to the extent of some $1575 per year. As a matter of actual experience, the life of the 18-inch roof will be materially greater than the 13½-inch thickness, thus still further increasing the savings accruing through the installation of the thicker roof.

Monkey walls, here considered as separate components, are actually an integral part of the front and back walls of the ends. They are vertical continuations of the roof knuckle and are introduced into the construction for the purpose of developing the section A_2 to the desired area and shape.

As may be seen by examination of Fig. 45 a considerable variation in the design of these components is apparent. For purposes of comment it is advisable to consider monkey wall design as relating to producer or mixed gas-fired furnaces and those furnaces fired with driven fuels, oil, tar, coke oven gas and the like. In the first classification three furnaces, A, N and O, have a minimum width at this location of less than 65 per cent of the bath width and may be considered of extreme development; two furnaces, J and K, are 76 and 69 per cent, respectively, and are considered as in a normal range. Monkey wall development is nearly absent in the two mixed gas fired furnaces, S, G and L.

Walls Are Water Cooled

The mass of brickwork is reduced in the monkey walls of furnaces A and J by niches at the outside; water cooling is practiced in furnace J.

Of the furnaces fired with driven fuel but two, M and P, have extreme monkey wall development, the width of these being about 60 per cent of the bath width. Of the others, B, D, E and F are normal at between 65 and 70 per cent. The monkey wall development in furnace H at 77 per cent is average while it is nearly absent in furnace I. Niches are found in furnaces B and H and the first is also water cooled.

The rarity of niches in or the water cooling of the monkey walls appears as supporting a considerable majority of operating opinion that the erosion and wear of these components come not as a result of the effect of temperature, but rather from the abrasive action of gas-borne particles and dust impinging in the inner wing walls at high velocity.

Silica brick is the principal refractory employed in monkey wall construction. The inner walls and the cheeks should be veneered with magnesite and /or chrome brick. If not of excessive depth, the outside surfaces of the monkey walls should be insulated.

The back and front walls of the ends are the plane, vertical walls covering the uptakes from and intermediate line between the slag pockets and throat, extending upward to the roof skews and from the end walls to the back wall wings at the furnace rear and to the end doors at the furnace front. They include the monkey walls previously discussed.

Inspection of Fig. 45 will show end walls to be developed at 13½, 18 and 22½ inches thickness with the majority at the median figure.

These walls are of considerable area, an average 150-ton furnace having more than 200 square feet for each element or at least 800 square feet for the entire furnace. It seems probable that the 18-inch thick wall is best as it permits the development of a wall of good thermal qualities and ample strength as well as allowing a maximum width for the uptakes.

Temperature conditions in 18-inch walls nearly parallel those shown as applying to the 18-inch roof in Table LXX. If correction is made for 800 square feet of end wall, using the cheaper 9-inch standard brick, comparative data for the 18-inch bare and insulated front and back walls will be as in Table LXXI. This table

LXX

Thermal and Economic Data of 13½ and 18-Inch Bare and Insulated Roofs on Furnace Ends

Silica brick Thickness Inches	r	Insulation r	Total resistance R	Installed roof cost	Radiation B.t.u./ sq. ft./hr.	Radiation Cost per year	Temperature, degrees Fahr. Insulation maximum	Temperature, degrees Fahr. Outer surface
13½	0.96	None	0.96	$1080	1980	$2300	None	550
13½	0.96	1.29	2.25	1305	898	1040	1567	385
18	1.28	None	1.28	1620	1600	1850	None	500
18	1.28	1.72	3.00	1920	713	825	1588	350

LXXI

Thermal and Economic Data of 18-Inch Bare and Insulated Front and Back Walls in Furnace Ends

Silica brick Thickness inches	r	Insulation r	Total resistance R	Cost of back and front wall	Radiation B.t.u./ sq. ft./hr.	Radiation Annual cost	Temperature, degrees Fahr. Insulation maximum	Temperature, degrees Fahr. Outer surface
18	1.28	None	1.28	$1740	1600	$2765	None	500
13½	0.96	1.29	2.25	1968	898	1552	1567	385

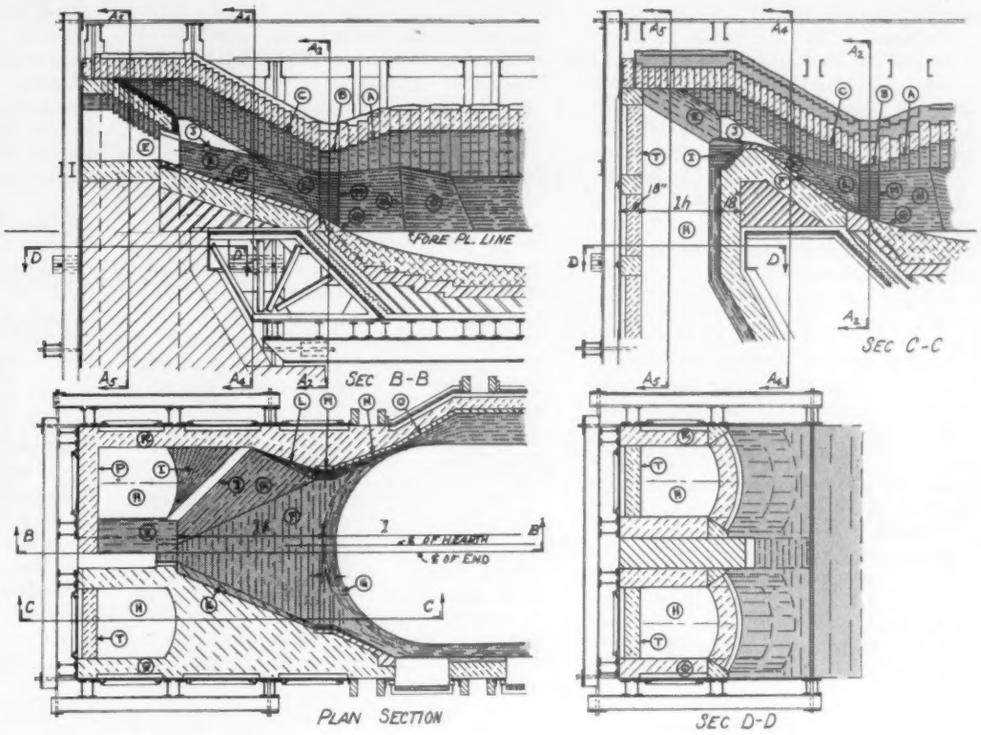


Fig. 59—Basic design of open-hearth furnace end for liquid fuel firing

shows that an added capital expenditure of but 13 per cent or $228 will give an annual return from savings of radiation losses alone of over $1200, assuming that both types of construction has a similar life. Late experience has shown the life of correctly insulated walls to be much greater than that of the bare walls.

The aprons extend from their junction with the end banks sloping upward to the bridge walls and fuel ports. The aprons also form the bottom of the throat which is supported by the top of the chill.

The bridge walls extend from the front and back walls to the fuel port to form a dam. They prevent the overflow of the bath into the uptakes as the result of an unusually violent bath reaction, they direct the incoming air to quick and intimate contact with the fuel, and assist in the easy turning of the outgoing furnaces gases. The aprons and bridge walls are of sloping or irregular formation and consequently it is convenient to employ mass brickwork in their construction. The furnace side of both of these components as well as the crests of the bridge walls should be paved with not less than 4½ to 9 inches of magnesite and/or chrome brick under which not less than 13½ inches of silica brick should be used. The balance of the mass, excepting the space for insulation, which should be used on all outer surfaces, may be hard-burned firebrick for medium duty.

Owing to the irregularity of the sections of these components, it is difficult to calculate the economic effect from the use of insulation. Such a calculation therefore, is omitted, although the judicious use of insulation is recommended on the grounds that its correct use always will accomplish a material betterment.

End walls of the furnace consist of a series of supporting walls in which the bulkheads, one to each air and gas uptake, or wearing walls are panelled. The principal function of the supporting walls is to protect the end steelwork, tying the furnace longitudinally, from deleterious thermal effects.

Bulkheads or wearing walls are

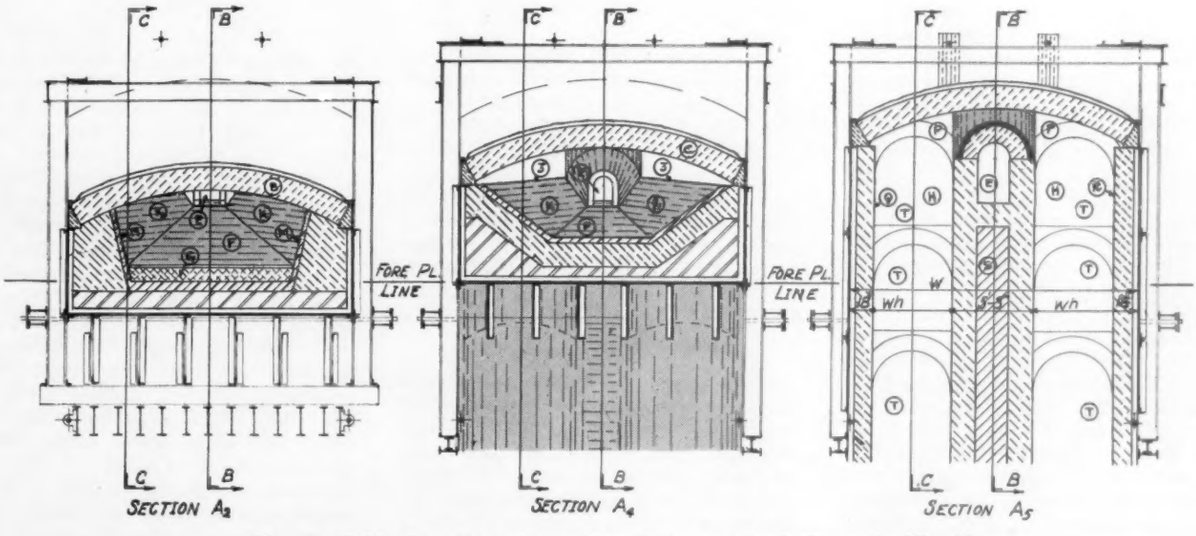


Fig. 60—Critical section of open-hearth furnace end shown in Fig. 59

inserted panels filling the areas between the supporting walls and are arranged for easy replacement as required, all but the most modern practice necessitating their frequent renewal. The supporting walls are invariably of silica brick, this same material, as well as single-burned magnesite and chrome brick being favored by various individuals for the bulkheads. Occasionally, water cooling is incorporated in the bulkheads, but with correct design this is unnecessary.

Number of Heats Varies

At a recent meeting of one of the open-hearth groups of operating men some eight operators reported bulkhead life of from 20 to 150 heats, while two men reported bulkheads lasting the campaign, about 400 heats.

Wear at the monkey wall cheeks and the bulkheads is occasioned by abrasion and impingement of gas-borne particles from the bath, not from temperature as such. The effect is aggravated by the turning of the furnace gases to the vertical stream lines of the downtakes, often through 120 degrees or more, centrifugal force causing the heavier or solid particles in the gas stream to gravitate to the back wall. The range of bulkhead life previously cited, 20 heats to the life of the furnace, is the gamut of poor to excellent furnace design and operation.

The factors of design will include special attention to end roof, and bridge wall contours and depth of downtake while the differences of operation largely will be found in the combustion practice.

In most open-hearth plants, the bulkheads are an eyesore. Usually, at the junctions of the loosely laid brick a high-heat color is evident, indicating a high-heat loss and the open interstices between the brick give visual evidence of a large infiltration of air, no matter in which direction the furnace is operating. An exception is a plant in the Great Lakes district where the furnaces are insulated completely, even as to the bulkheads; near the conclusion of a campaign of 400 to 430 heats, the palm of the hand may be laid on the covering insulation of the bulkheads without discomfort.

Based on an average 150-ton furnace the thermal and economic data on bare and insulated end walls will be similar to the figures in Table LXXII. The construction costs given in this table are based on the inclusion of double-burned magnesite brick in the bulkheads. Two end walls are included. The substitution of single-burned trade-marked magnesite or chrome brick, which appear to be favored in the majority of plants, will modify the construction costs to some degree.

In this table as in those previously given the great economic value of the proper use of insulation again is demonstrated. An addition to the initial capital cost of $500 will produce an annual saving of more than double that amount. The use of insulation, however, requires caution. Operators often are prone to the belief that insulating a particular component of a furnace that has not been showing a satisfactory life will at once prolong the life of that component.

Nothing could be more fallacious, because the unduly short campaign of any part is primarily an indication of faulty basic design or operation which must be remedied before any other improvement can be accomplished. If uninsulated bulkheads now giving a small number of heats are insulated, the logical assumption will be a still smaller number of heats for the insulated surfaces.

Will Require Insulation

Future practice, either new construction or the re-engineering of existing furnaces, will require the complete insulation of furnace ends. The most desirable method of insulation will call for the complete enclosure of the ends, by steel plate. It will be desirable especially to insulate under the buckstays. If this is to be accomplished the material used will be limited to certain insulations that have considerable mechanical strength and which are rather costly. If designs are used similar to those shown in Figs. 57, 58, 59 and 60, the costly material is used only immediately under the buckstays, while less costly, but equally effective material of little or no mechanical strength may be used in the panels between buckstays.

Two Designs Presented

For the purpose of developing a method of designing the refractory structure of furnace ends, to accomplish certain desirable features of fluid flow, the ends of two furnaces, developed in accordance with an advanced line of thought are presented in Figs. 57, 58, 59 and 60. The first of these shown in Figs. 57 and 58 is a basic design for a producer gas fired furnace, while the second shown in Figs. 59 and 60 is suitable for use with the end firing of driven fuels such as oil, or tar, or gaseous fuels, such as by-product coke oven gas, natural gas or the like.

The first and principal value to establish and upon which the entire design of the ends will be premised is the area A_2 the cross-sectional area at the roof knuckle and monkey walls. The developed area here will be based first from the desired velocity of the gases through this area and second from the volume of gases to pass in a unit of time. The former figure will be selected from data such as is presented in Table LX taking into account the type of fuel to be used, and the fuel rate, and the latter developed from the furnace production in tons of steel made per time unit. This may be established from data as in Table LXIII which indicates rates of from 10 tons upwards, approaching 20 tons per average hour as usual practice.

(*To be continued*)

Table LXXII

Thermal and Economic Data of Bare and Insulated Furnace End Walls

Grade	Brick Thickness, inches	Brick r	Insulation r	Total Resistance R	Cost of two end walls	Radiation B.t.u./sq. ft./hr.	Radiation Cost per year	Temperature Insulation Maximum degree	Temperature Outer surface Fahr.
Bare End Walls									
Silica	18	1.28	None	1.28	$ 940	1600	$1495	None	500
Magnesite	13½	0.60	None	0.60	2290	3200	$1135	None	700
					3230	4800	$2630		
Insulated Walls									
Silica	13½	0.96	1.29	2.25	$1230*	900	$1477	1567	385
Magnesite	13½	0.60	1.65	2.25	2500*				
					3730				

*Includes 4½ inches of insulation.

Making the Most of

METHODS AND MATERIALS

IN CONNECTION with its cupola-electric duplexing process, the malleable iron division of a large automobile manufacturer has developed insulated and covered bull and pouring ladles which greatly reduce the amount of superheat required in the electric furnace. In addition, certain changes in charge and operation of the cupolas have increased the tapping temperature at the spout by approximately 100 degrees. The new pouring ladle has 2½ inches of refractory backed up with 1¼ inches of insulation and a ¼-inch metal shell. Average life of the new ladle is 23 actual pouring days, as compared with a 4-day life for the old type. Covers have an average life of 8 days. Average life of the new bull ladle is 14 days, against 4 days for the old type; cover life is 4 days. Economies accruing from the new method of operation are 40 per cent reduction in superheating energy; 45 per cent reduction in electrode consumption; 65 per cent increase in electric furnace capacity; 48 per cent reduction in foundry spillage; 5 per cent reduction in overall ladle maintenance; and 75-degree increase in temperature of the last iron out of the pouring ladles.

$ $ $

Nickel cast iron is finding use in France as floor plates in a battery charging station. Resistance to sulphuric acid is its strong point.

$ $ $

A RECENT development in the use of molybdenum is its application to the 15 per cent chromium stainless steels. The addition of 0.50 per cent molybdenum to this well-known steel greatly increases the strength and wear resistance. In addition to this, the screwing together of bolts and nuts made of this material, which heretofore has been difficult, is made much easier because of the nonseizing properties imparted by the molybdenum addition.

$ $ $

The field for gas cutting of steel parts has been very much enlarged by the application of coal gas to the cutting torch. Due to the low heat generated, the temperature gradient avoids the migration of the carbon to the surface, hence the average high-grade steel can be machined about the surface, hardness being not over 0.002-inch deep. Cutting with city or coal gas gives a very satisfactory sharp edge and makes unnecessary the grinding of the surface to efface round edges.

$ $ $

In studying metal wear in the refractories industry, a series of tests were performed to determine the wearing properties of various metals for pug mils. Cast-iron knives offer resistance to wear, but they are brittle and there is considerable danger from breakage with possible damage to the brick machine auger and dies. A chrome iron knife was

ressitant to wear and at the same time seemed to have a certain degree of toughness. A cast-iron knife coated with stelite showed more wear than the uncoated knife and the worn surfaces were irregular. Manganese steel knives gave moderately good service but resistance to wet abrasion was not very high. Forged steel and machine steel knives were not satisfactory due to their softness.

$ $ $

The United States bureau of printing and engraving is hard chrome plating the plates used in the printing of paper currency and postage stamps. The United States mint is chroming coin and stamping dies. It has been reported that a thin layer of chromium is being applied to the bore of small and large caliber guns, which has the effect of reducing the erosion and wear as well as increasing the resistance to corrosion and thus increasing life. The reported thickness of chromium used is 0.0004-inch.

$ $ $

Steel castings containing 1.50 per cent chromium and 0.60 per cent molybdenum have found considerable favor for use at high temperatures and pressures.

$ $ $

CADMIUM is a most interesting metal as it can be made to combine decorative value with efficient rust protection. Cadmium plate from plain solutions has a matte white appearance somewhat similar to zinc coatings. Coatings which are produced in baths compounded with proper addition agents are bright and lustrous. The luster of cadmium, while not indefinitely permanent, nevertheless endures for a long time, and is therefore to be compared with nickel in this respect. However, nickel surfaces must be buffed, as they come from the plating bath somewhat cloudy. This is not necessary with cadmium.

$ $ $

Using a tool tipped with tantalum carbide, a scientific instrument manufacturer was able to perform the intermittent facing and boring job on a cast semisteel vacuum pump in a single 5/32-inch cut. With high-speed tools formerly used, both a roughing and finishing cut were required.

$ $ $

A photoelectric smoke density indicating and recording equipment for installation in the stacks or breechings of power plants utilizes a light unit and a photoelectric unit which are mounted diametrically opposite on the smoke stack, with a beam of light passing directly across the stack. As the density of the smoke in the stack changes, the light reaching the phototube increases or decreases. The resulting change in the phototube current is amplified by a pliotron tube and passes through an indicating or recording meter which is calibrated directly in units of smoke density. The equipment may also be arranged to close an alarm contact at any desired smoke density.

NEW BOOKS WORTH READING

SCIENCE ◆ ECONOMICS ◆ BUSINESS

Minerals in Civilization Given Popular Treatment

Our Mineral Civilization, by Thomas T. Read; cloth, 165 pages, 5 x 7½ inches; published by the Williams & Wilkins Co., Baltimore; supplied by STEEL, Cleveland, for $1 and in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This volume is one of the Century of Progress series, which will cover everything from entomology to communication, and from mathematics to anthropology. Under the heading "Modern Magic" the author discusses coal and its contribution to modern civilization. The important place occupied by petroleum in providing transportation by motor is pictured under the heading 'The Magic Carpet."

Progress in development of iron and steel for commercial use and the highly important part that they play in every line of activity are pictured briefly in "The Skeleton of Modern Industry." This is followed by a discussion of "Vulcan's Three Sons," discussing copper, lead and zinc.

Other chapters are devoted to stones, and the "junior metals," aluminum, tin, arsenic, mercury, manganese, chromium, vanadium, cadmium, zirconium, etc. Radium, helium, neon, fluorine, beryllium, selenium, tellurium, platinum, osmium, tantalum, cerium, and caesium also are discussed.

The book is written in popular style intended to be entertaining as well as educational.

◆

German Steel Research Offers Much Valuable Information

Bulletin of Kaiser Wilhelm Institute for Iron and Steel Research, Vol 14; 305 pages, 460 illustrations, 140 tables; published by Verlag Stahleisen, Breite strasse 27, Duesseldorf, Germany.

This volume is made up of 20 bulletins, covering a wide variety of metallurgical problems. The mechanical side of steel research received less attention in this volume than in those that have preceded.

In a brief review, it is hopeless to do justice to the volume of information contained in these bulletins. It includes: The influence of copper on solubility of mild steel in acids; testing and grading of cold-rolled mild steel strip; the system calcium oxide-phosphorus peroxide; the fatigue strength of carbon and low-alloy steels; total radiation of oxides; decomposition of austenite; production of high-speed tool steel in the induction furnace; influence of chromium upon transformations of carbon steels; equilibrium of the chlorides of lead and tin; precision measurements of grating; damping and vibratory strength of steels; quick determination of vanadium in ferrovanadium; simultaneous determination of iron and chromium in alloys; relations between iron containing manganese and slags consisting mainly of the suboxides of iron and manganese; metallurgical phases of the Thomas process; progress of deoxidation in production of transformer steels; absorption of hydrogen by steel which is treated with acid; determination of molybdenum; fatigue strength of steel for superheater tubes; mechanical properties and structure of seams welded by different methods; diffusion into solid iron by metals sprayed on iron.

Iron and steel metallurgists who can read German will profit greatly from a study of these bulletins.

By Prof. W. Trinks

◆

British Income Tax Manual Guides Making of Returns

Tolley's Income Tax Budget Handbook, 1933-34; paper; 20 pages, 5½ x 8¾ inches; price 1s net; published by Waterlow & Sons Ltd., Great Winchester street, London, E. C. 2, England; supplied by STEEL, Cleveland.

The 1933-34 edition of this handbook covers income tax and surtax regulations for Great Britain and the Irish Free State. The only important change in the current year's budget is provision for the first instalment of tax on all kinds of earned income to be limited to half only and not three-quarters, the second half to be paid July 1.

◆

Young Engineers Shown How To Sell Their Services

The Technical Man Sells His Services, by Edward Hurst; cloth; 239 pages, 5½ x 8 inches; published by McGraw-Hill Book Co.; supplied by STEEL, Cleveland, for $2, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

A practical method of turning the tables on the employer and selling services to him instead of asking him for work is offered the technically trained man in this volume. It is by a man experienced in placing men in positions and is developed from a private edition supplied to seniors of the Massachusetts Institute of Technology during the winter of 1932-3. It represents a unique engineering education experiment in selling technical experience.

The method recommended to the graduate and illustrated in a number of suggested methods is eminently practical. Ten hypothetical cases are used to illustrate the method of approach and treatment of the obpections of the employer when a young engineer applies for work. They are based on actual experiences in which Mr. Hurst advised and aided the job seeker. They show the application of scientific methods in to getting the particular position the graduate is seeking.

◆

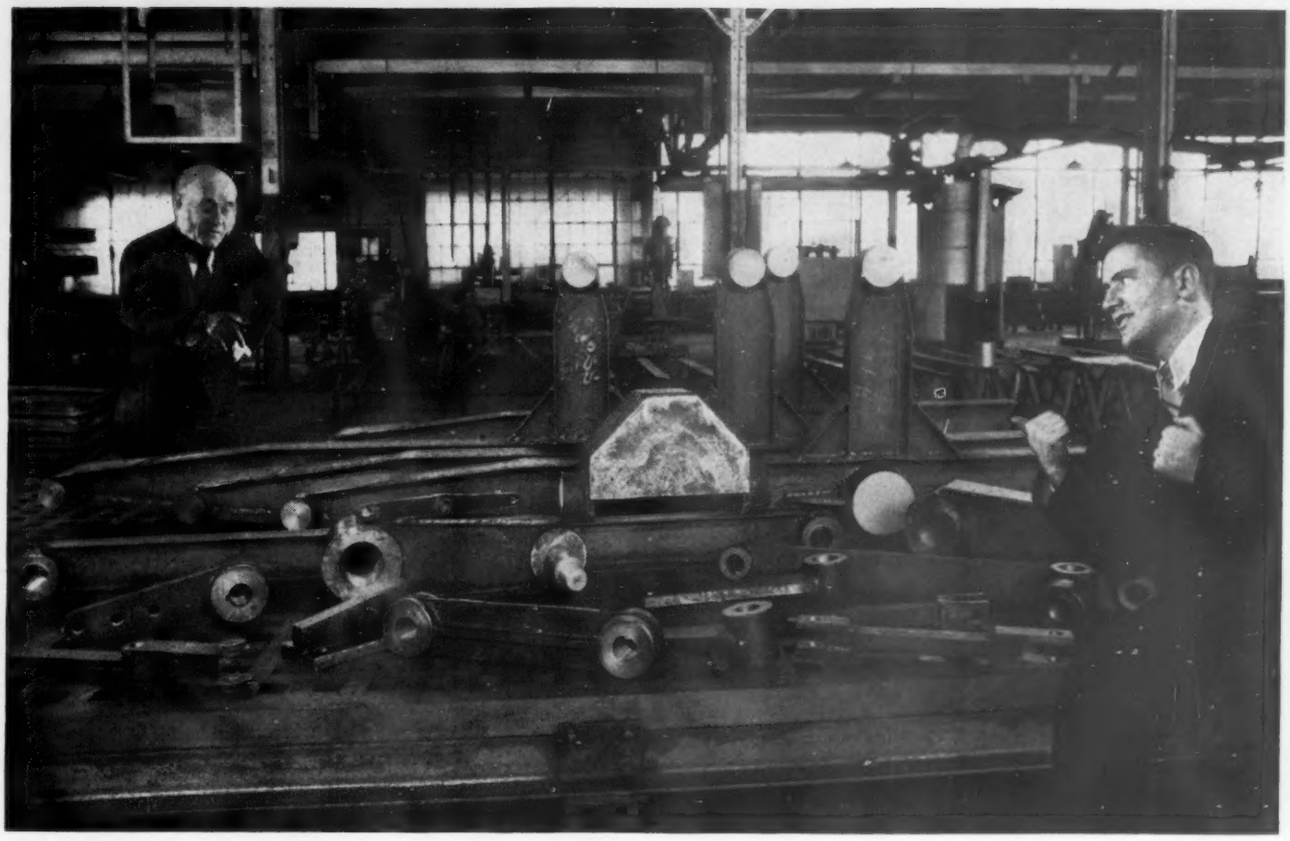
Industrial Management Is Analyzed for Students

Principles of Industrial Management, by E. A. Allcut; cloth; 218 pages, 5¼ x 8½; published by Isaac Pitman & Sons; supplied by STEEL, Cleveland, for $3, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The author is professor of mechanical engineering in the University of Toronto and the book has been prepared primarily as a text for students. It deals first with the historical aspects of our industrial structure and discusses laws, standards of quality, performance and practice as they apply to industry, followed by a chapter outlining the principles of sound management.

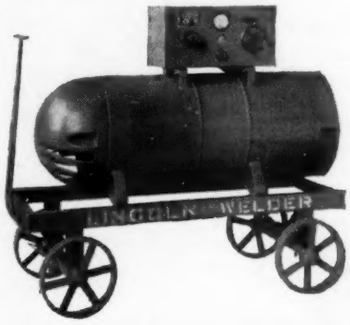
The discussion continues with an outline of industrial organization, reports of written and graphic types, designing and drafting department, purchasing, budgets, planning, receiving department, which includes the handling and storing of materials, arrangements for manufacture and assembly, time and motion study, inspection, payment of labor, costs and cost keeping, personnel, waste and scientific time study.

The work carries 57 illustrations, including various forms and cards used in management or production work. An appendix prepared by T. C. Graham presents examples of time study.



"Here, Lad, are examples of 1933 manufacturing practice. The superintendent told me that these are typical of more than 200 machinery parts which they formerly cast but now build better of rolled steel shapes and plate arc welded.

"He also told me that they saved 27% of their former cost by using arc-welded steel construction, plus the saving of pattern cost which he said would have been a big item."



"Yes, Pop, and another big cost cutting item was their Lincoln welding equipment.

"The use of Lincoln *'Shield-Arc'* welders and *'Fleetweld'* electrodes is guaranteed to give you:

1. More weld metal deposit per K.W. H.
2. Faster welding per K.W.H.
3. Lower cost per unit of welding—the unit being per lineal foot of weld, or per pound of weld metal, or per hour of welding.

"A *'Shield-Arc'* soon pays for itself out of the savings it makes—ask for proof from

LINCOLN

THE LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO

Largest Manufacturers of Arc Welding Equipment in the World

W-42

Photo courtesy
Lincoln-Schlueter Floor Machinery Co. Inc., Chicago

HERE is shown one of the larger sizes of floor sanding or surfacing machines. These units are built largely of steel and weigh from 200 up to 300 pounds. This class of machine alone accounts for the consumption of nearly 200 tons of steel annually

LARGE USES OF STEEL IN SMALL WAYS

245th Article ◆ Floor Machines

SPECIALLY-DESIGNED machines have done considerable to eliminate backache from the operations of floor sanding, waxing, polishing and scrubbing. This work now is accomplished as easily as grass cutting with a power mower and is done much more quickly and efficiently than is possible by the old hand processes. In resurfacing floors in large buildings, as well as in homes, and in washing daily the miles of corridors in city skyscrapers, this equipment has proved itself indispensable.

Demand for these machines during the past several years naturally has felt the effects of quietness in building operations. Sales of sanding machines formerly amounted to around 5000 annually, but recently have dropped to 1500 to 2000 units yearly. Floor surfacers are made almost exclusively of steel, this material having been found to be best adapted for hard usage.

Shown in the accompanying illustration is one of the larger types of surfacers. These are made in various sizes, ranging in weight from nearly 200 pounds to more than 300, the electric driving motor accounting for about one-half the weight.

Body of Pressed Steel

Bars, tubing and flat rolled material comprise most of the steel parts required in the building of floor surfacers. Cast iron is used for some of the gears. The body of the machine on which the motor is mounted is of pressed steel as also is the protecting shield for the sanding roll. The roll is a piece of tubular steel, commonly ⅜-inch in wall thickness, and 9 to 15 inches long, around which is applied a pad to provide a cushion for the sandpaper which is fastened to the outer surface.

Cast-iron plates are affixed to the ends of the drum which is connected to the motor by means of a steel chain drive. The motor also drives a suction fan which conducts dust resulting from the sanding operation through a steel pipe to the collector bag. A steel bar fastened to the motor provides the support for the handle used in guiding the machine.

Nearly 200 tons of steel are required yearly in the building of the larger sizes of surfacing machines, including the motor. Manufacture of smaller types for lighter work and of scrubbing and polishing machines involves several hundred tons additional. The latter differ from the surfacer in using brushes rather than a sanding roll, these being of the twin-disk type, motor-driven.

When used for scrubbing, these machines are provided with a unit to dispense soap and water ahead of the revolving brushes, while certain types also incorporate a water pick-up apparatus which automatically picks up the dirt and water behind the brushes by a squeegee and suction and delivers it to a separate waste container. Scrubbing machines also are used for floor work in garages, bakeries, and the like, employing steel wire brushes to remove grease and embedded dirt which cannot be taken off easily by ordinary hand mopping. Water dispensing tanks on scrubbing machines are made of steel, as also are various other miscellaneous parts.

For the home, small offices and stores, scrubbing and polishing machines are designed in sizes comparable with that of the ordinary vacuum cleaner.

Develops New Solder for Stainless-Type Steels

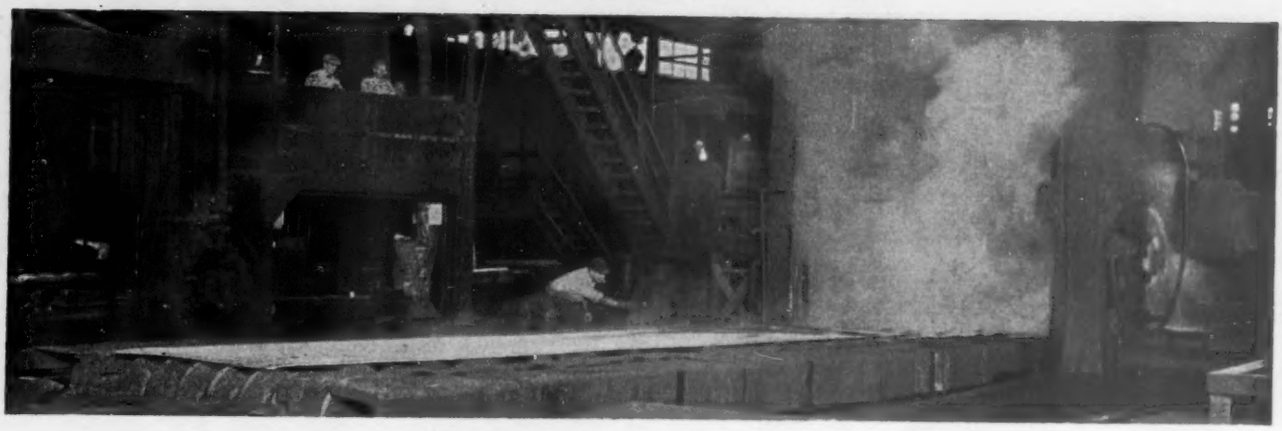
An acid-core solder for use with stainless steel, chromium plate and monel metal and claimed to be unique in application, economy and strength of bond, has been placed on the market by the Berry Solder Co. Inc., 146 West Twenty-fifth street, New York.

Considerable difficulty sometimes is experienced in soldering stainless steels because of their peculiar characteristics. This new solder has been developed after considerable research in co-operation with several fabricators of noncorrosive steel. Its makers point to a saving in operation with new and wider application of solder in fabricating this type of steel.

Plating Method Described

Information on a cadmium-mercury process for plating iron and steel parts is contained in a 22-page operating manual recently issued by the R. & H. Chemicals Department, E. I. duPont de Nemours & Co., Wilmington. The informative treatise covers preparation of the solution, operating conditions, replenishing, bath analyses, testing the coating, cleaning the metal prior to plating and other esesntial data.

ADVERTISING PAGES REMOVED



PROGRESS IN STEELMAKING

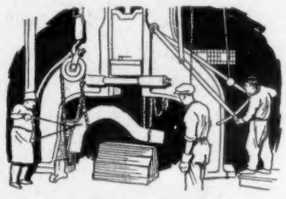
GRINDING the interior walls of stainless steel tubes 3½ inches diameter is facilitated by a recently designed portable tool driven by a motor of the multiple type. The unit also may be employed for cleaning tubes that have become coated with scale in service.

♦ ♦ ♦

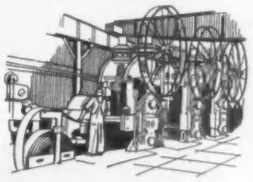
Tantalum carbide now is being used for wire drawing dies, mandrels for tube mills, precision instruments and other applications involving resistance to wear but not requiring any cutting action.

♦ ♦ ♦

A sticker now is being developed for mechanically feeding strip into the gap of cold rolls. In operation, the end of the strip is fed between the wiper blocks and allowed to protrude about a foot. After the desired tension is applied to the strip between the blocks, a lever is manipulated which moves the sticking machine toward the mill and causes the end of the strip to be fed into the bite of the rolls.



TWO rams of equal weight, which are driven toward each other at equal velocity, is the principle incorporated in a new type double drop forging hammer developed in Germany. As a result, the anvil block is eliminated. Only a light foundation is required since no striking pressure is exerted on the ground. Transformation of the energy of motion into deformation work, it is claimed, is effected economically owing to the absence of the anvil loss, even with most severe blows on the die. The unit is made of steel throughout with the exception of the cylinder and is designed to strike a maximum of 80 blows a minute.



MORE accurate reading of the thickness of strip steel in the process of reduction than is possible with a micrometer is claimed for a continuous gage which operates over any speed range of cold strip mills. The gage, which includes a mechanical contactor and an electric circuit, indicates in magnified and visible form any variations in the thickness of the strip being rolled. Hardened precision rolls contact the top and bottom surfaces of the strip about 3 inches in from the edge, being held in position by spring pressure. Any variation in the gage of the product passing between the rolls will force them together or apart. Alterations in the distance between the rolls are magnified by the electric circuit and are indicated on a microammeter. A photoelectric recorder may be employed in connection with the instrument to obtain a permanent record of gage variations. The scale of the device can be adjusted to read plus or minus 0.001, 0.002 or 0.004-inch. The unit may be located in any convenient place in the mill inasmuch as it is not affected by vibration.

♦ ♦ ♦

Light weight structural shapes are being fabricated from 18-8 alloy steel, the noncorrosive properties affording permanent rigidity and strength. On account of the austenitic structure, the alloy is rendered hard by cold working. In fact, in the form of light-gage cold strip tensile strengths ranging from 150,000 to 180,000 pounds per square inch have been obtained, thus making the metal suitable for structural purposes.

♦ ♦ ♦

While resistance to scaling of high-chromium steels is improved considerably by silicon and aluminum, yet these elements cause the steel to become brittle when subjected to high temperatures, according to tests recently made in Germany. Nickel frequently is added to the steel to offset the detrimental effect of aluminum and silicon.

♦ ♦ ♦

Moisture content of coal, coke, powdered fuel, etc., may be determined by a recently marketed apparatus which includes a scale, a measuring scoop, a shaper and an absorbent material.

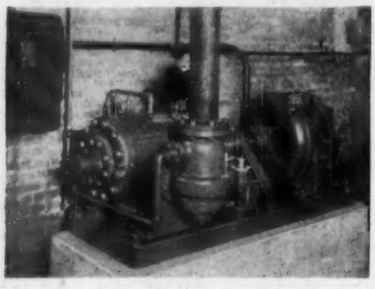
RIMMING action of basic open-hearth steel in the mold is brought under better control when the recently devised triple alloy of manganese, silicon and aluminum is used as a mold addition instead of shot aluminum, according to an experiment conducted at an open-hearth shop. Moreover, this practice has been found to eliminate to a large extent the hard particles which frequently result from the segregation of particles of aluminum.

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Announces New Line of Air Compressors, Vacuum Pumps

Allis-Chalmers Mfg. Co., Milwaukee, recently placed on the market a complete line of rotary air compressors and vacuum pumps of the



Allis-Chalmers single-stage water-cooled rotary air compressor

multicellular, sliding-vane type in both water-cooled and air-cooled designs. In the accompanying illustration is shown one of the new single-stage water-cooled rotary air compressors. The line covers a range of volumes from 50 to 2000 cubic feet per minute at pressures up to 150 pounds, and vacuums up to 29.85 inches mercury. The air-cooled units are suitable for pressures up to 10 pounds gage and vacuums up to 18 inches mercury, and the water-cooled units for higher pressures and vacuums. Smooth operation, small dimensions, continuous delivery and absence of maintenance requirements are a few of the advantages presented. No belts or pulleys are normally required, as the units operate at standard motor speeds.

◆

Hoist Equipped with Safety Overload Governor

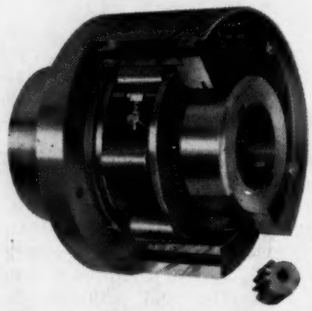
Chisholm-Moore Hoist Corp., Tonawanda, N. Y., is marketing a new high-speed hoist with patented safety overload governor. Noteworthy is the rugged, simplified construction and the safety overload governor which warns against dangerous, excessive overloads and protect hoist, load and operator against accidents.

Another important feature is the adjustable load brake. It operates with minimum effort and prevents self-lowering of load. Internal gears are packed in grease in an oil-tight, dust-proof housing. Hoists are available in a wide range of capacities, from ¼ to 40 tons.

◆

Free-Wheeling Clutch Meets Industrial Requirements

Kelpo Clutch Co., 216 Mill street, Rockford, Ill., is marketing a free-wheeling clutch suitable for many industrial applications. The unit, shown herewith, is suited to all speeds up to 3600 revolutions per minute and was particularly developed for coupling two prime movers to a common load so that the prime mover which is not in use comes to a rest automatically. Typical applications include pumps with gasoline engine and electric motor drives; induced and forced draft fans with turbine and motor drive; booster



Free-wheeling clutch marketed by Kelpo Clutch Co.

drive for starting heavy machines such as steel mill machines, paper mill machines, etc. By using this type of clutch it is not necessary to employ any form of interlock between the two power sources to keep them from pulling each other through the load.

◆

Impurities in Materials Detected by Device

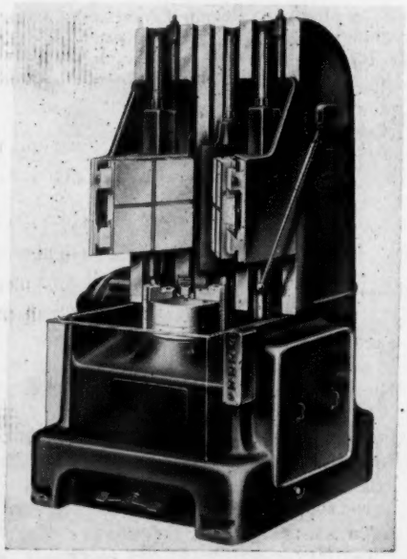
General Electric Co., Schenectady, N. Y., has developed a magnetic device which detects and measures the extent of magnetic impurities in asbestos, mica, glass, sands and similar materials. The apparatus consists of a differential permeameter and an indicating device. In the case of asbestos, the magnetic effect of the iron impurities is proportional to the quantity of impurities present.

The permeameter consists essentially of a coil for producing a high magnetic field for magnetizing the specimen, and two equal secondary coils for measuring the magnetic effect. These latter coils are placed in the magnetizing coil and connected to the indicator with their induced voltage in opposition. The specimen is placed in one of the secondary coils, thus disturbing their electrical equality. The effect on the indicator is proportional to the quantity of magnetic impurities present.

◆

Unit Designed To Be Flexible, Automatic, Mobile

Bullard Co., Bridgeport, Conn., recently introduced a new single-spindle automatic vertical lathe, the first of a new line of machines based on "Flex-Au-Mobility" (flexibility, automaticity and mobility). Flexibility as required by the metalworking industry is important from the standpoint of tool setups and their functions. Therefore this machine, shown herewith, has been designed with three slides—two universal slides, each provided with swivel for angular cutting, and one plain vertical center slide, each of which is individually controlled by separate and independent feed works. These feed works are designed to give a total stroke of 20 inches. For chucking work the universal slides have a



Single-spindle automatic vertical lathe manufactured by Bullard Co.

THERE IS A DIFFERENCE

TOOLS look a good deal alike at the start—but long hours of production work soon demonstrate what a difference there is.

Results show the value of careful steel selection, thoroughly mastered heat treating procedure, rigid adherence to accuracy standards. These are the reasons why Morse Tools are different. They work longer and faster between sharpenings. They bring your production costs down where they belong.

MORSE

TWIST DRILL & MACHINE COMPANY

NEW BEDFORD, MASS., U.S.A.

New York Store, 92 Lafayette Street

Chicago Store, 570 West Randolph Street

The Morse Line includes High Speed and Carbon

DRILLS
REAMERS
CUTTERS
TAPS AND DIES
SCREW PLATES
ARBORS
CHUCKS
COUNTERBORES
MANDRELS
TAPER PINS
SOCKETS
SLEEVES

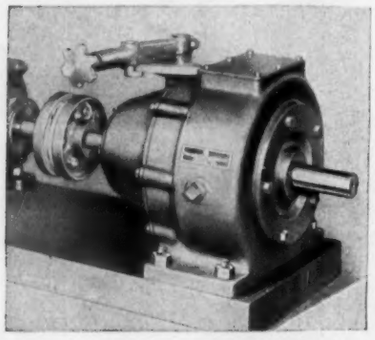
downward and inward movement, while the center slide has only a vertical movement.

The application of tail stock converts this machine into a center turning lathe, when the universal slides may be easily changed to obtain an inward, downward, outward, and upward movement which is essential in many jobs of center work. Rapid traverse for these three individual heads is obtained through an independent motor, electrically interlocked, permitting the use of one motor for the selective traverse of any individual head. Each of the three heads is provided with eighty independent feed changes.

◆

Clutches Transmit Power In Variable Reducer

Smith Power Transmission Co., 1213 West Third street, Cleveland, is distributing the new Johnson variable reducer, strictly a mechanical device which does not operate under sliding or rolling friction. The unit, shown herewith, is composed of five one-way overrunning clutches; the five clutches transmitting power to uniform cycles to a centrally mounted driven gear. The driven gear is mounted on a hardened and ground output shaft which in turn is mounted on two ball bearings. Power may be taken from the output shaft through a coupling, sprocket and chain, sheaves and V-belt, pulley or any other type of drive. Output speed ranges from zero to 240 revolutions per minute.



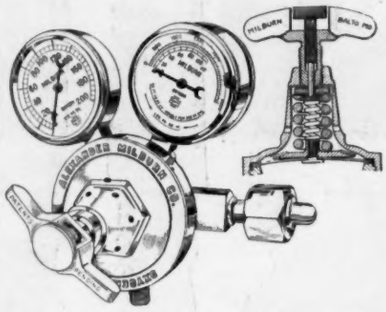
Variable reducer distributed by Smith Power Transmission Co.

◆

Regulator Is Equipped with Micrometer Adjustment

Alexander Milburn Co., 1416-28 West Baltimore street, Baltimore, recently developed a regulator for use with oxygen, acetylene and other gases, which has a dual adjustment comprising a fine micrometer adjusting key housed within and operating separately from the main regulator key.

The main key operates a heavy spring, and the micrometer adjustment key a fine bronze spring which enables the operator to secure a range of from zero to approximately 5 pounds, in addition to the adjustment obtained with the standard adjustment key. For instance, if the key is screwed down until there is a pressure of 10 pounds, the micrometer key adjusts fractions of an ounce up to 5 pounds more. The regulator is extremely sensitive for the finer pressures necessary for low pressure torches and small torches doing fine work and requiring close adjustment. It is invaluable for torches working on aluminum, airplane parts, fine experimental work, lead burning and also for laboratory work, the manufacturer claims.



Micrometer adjustment regulator introduced by Alexander Milburn Co.

◆

Controller Operates One or More Valves as Unit

Automatic Temperature Control Co. Inc., 34 East Logan street, Philadelphia, recently introduced a new unit (below) to meet a demand for a controller of the two-piston type to operate one or more valves as a unit. Known as type 2, the controller has sufficient power to handle an air valve up to 4-inch in combination with a ½-inch fuel oil valve, or to handle two valves up to 4-inch as a unit on low pressure gas and air.

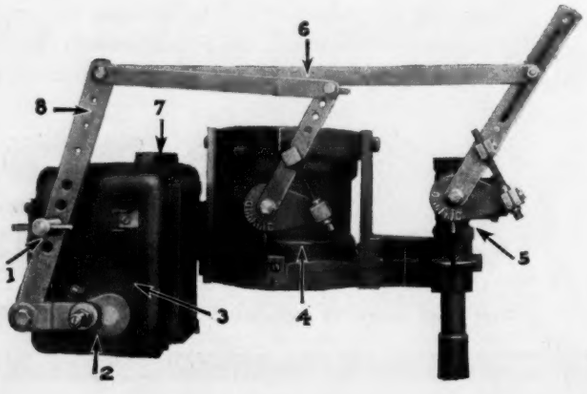
Maximum setting for both fuel and air valves can be obtained by adjusting the connecting links 6 where attached to the valve levers, and where attached to main operating lever 8. A feature of the unit is the ability to remove the fulcrum stud 1 quickly, thus permitting the attendant to move the main operating lever 8 with attached valves to any desired position manually. This feature is a convenience when starting up a furnace and it also eliminates the expense of by-passing piping and valves for the air line.

◆

Instrument Adapted To Test Hardness of Wire

R. Y. Ferner Co., Investment building, Washington, which introduced in America in the fall of 1931 a portable hardness testing instrument, called the Duroskop, for the general testing of hardness, is offering a special form of this instrument for testing the hardness of wire and other cylindrical material of small size.

In this instrument hardness is measured by the angle of rebound of a falling pendulum. For testing wires the usual spherical anvil of the hammer head of the pendulum is replaced with a cylindrical anvil, the axis of which is parallel to the pendulum rod. Rapid routine tests of wire are possible with this instrument, even with the wire in motion. The suitability of wire for drawing, coating, hard drawing or for nail heads, for binding wire, etc. can be determined in a short time. The device also can be used for testing the hardness of steel balls.



Two-position motor-operated controller manufactured by Automatic Temperature Control Co. Inc. It will move automatically a damper, rheostat or one or more valves as a unit to an open or a closed position

Steel Rate Advancing, While Buying Slackens

Operations, at 57 Per Cent, Approach 1930—Adoption of Industrial Code Adds To Strength—Pig Iron Price Rise General—Railroads Heavier Buyers

SPECIFICATIONS against contracts are broadening sufficiently to lift the steelworks operating rate two more points to 57 per cent, but the tendency of consumers to withhold further commitments, especially in view of the higher prices that would be applied, is more pronounced.

Automotive consumption is undiminished; railroads in an unspectacular but more satisfactory volume are placing material for equipment repairs; farm implement manufacturers are more active; the oil and brewing industries' requirements are expanding; but building construction continues better in prospect than in actuality.

Steelmakers are confident of a revival in buying toward the close of July or early next month, as a comparatively small proportion of requirements for August and September have been covered. In the meantime, the majority of mills have sufficient backlogs to carry them at their present rate to the middle of August.

Continued pressure for material, the bulk of which is going into immediate consumption, has raised the steelworks rate in practically all districts. Cleveland is up 5 points to 87 per cent; Birmingham, up 2 to 77; Youngstown, up 3 to 66; Buffalo up 8 to 62; Chicago up 4 to 60; Pittsburgh up 2 to 48; eastern Pennsylvania up 2 to 42. The Wheeling district remains at 90 per cent; Detroit is operating at 55.

The national average of 57 per cent, reaching for the first time the 1930 trend line, compares with 80 per cent as the average for July in the five years, 1926-30.

Tin plate mill operations have rebounded to 95 per cent, following a brief letdown due to the holiday in the preceding week. A Cleveland steelworks operating at capacity, and unable to put another blast furnace into commission immediately, has purchased 10,000 tons of basic iron from the Ford Motor Co.

An element of strength has been added to the markets by adoption of the steelworks industrial code, which was to be filed with the recovery administration July 17, raising wages and putting in effect a maximum work-week of 40 hours. Largely in anticipation of this, but also because of recent advances in coal and coke prices, pig iron producers throughout the country have raised prices $1 a ton, effective immediately.

While no further advances have been made in finished steel prices, it is evident that the large consumers of plates, shapes and bars will have to pay more for their material after July 31, when single open-market prices will go in effect.

On some of the lighter finished products, chiefly sheets and strip, there is a tendency to quote prices as advanced for July through the remainder of the quarter. Wire mills have adopted this policy. Seamless steel boiler tubes have been advanced $8 to $12 a ton. Fluorspar is up $3.50 a ton.

Plate demand is beginning to feel renewed impetus from larger buying by the railroads, ship and barge builders, as well as from the oil and brewing industries. Car and locomotive repair shops have increased their operations.

Pennsylvania railroad is to take 5150 cars from storage for repairing this month, in addition to 5600 previously scheduled. Northwestern roads are getting equipment in condition for a heavy grain movement. Erie is expected to release 6000 tons of rails on last year's purchase. Structural shape awards for the week dropped to 5700 tons.

Due to the advance in pig iron prices, STEEL's iron and steel composite has risen 46 cents to $30.13. The finished steel composite is off 10 cents to $47.40, reflecting the willingness of some producers to accept hot-strip at 1.60c, base, Pittsburgh; while the steelworks scrap composite is up 34 cents to $10.50.

Composite Market Averages

	July 15	July 8	One Month Ago June, 1933	Three Months Ago April, 1933	One Year Ago July, 1932	Ten Years Ago July, 1923
Iron and Steel Composite	$30.13	$29.67	$28.73	$28.16	$29.47	$45.39
Finished Steel Composite	47.40	47.50	45.30	44.94	47.71	68.33
Steelworks Scrap Composite	10.50	10.16	9.55	7.23	6.06	16.45

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	July 15, 1933	June 1933	April 1933	July 1932
Pig Iron				
Bessemer, del. Pittsburgh	18.13	17.26	16.26	15.76
Basic, valley	16.00	15.00	14.00	14.00
Basic, eastern, del. eastern Pa.	17.19	16.19	14.19	14.25
No. 2 foundry, del. Pittsburgh	17.63	16.70	15.76	15.76
No. 2 foundry, Chicago	17.00	16.00	15.50	15.50
*Southern No. 2, Birmingham	13.00	12.00	11.40	11.00
**No. 2X Virginia furnace	18.75	17.75	17.75	18.00
**No. 2X, Eastern, del. Phila.	17.63	16.76	14.51	14.76
Malleable, valley	16.50	15.50	14.50	14.50
Malleable, Chicago	17.00	16.00	15.50	15.50
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	23.04
Gray forge, del. Pittsburgh	17.13	16.63	15.63	15.63
Ferromanganese, del. Pittsburgh	87.24	73.24	73.24	73.24
Coke				
Connellsville, furnace, ovens	2.00	1.80	1.75	2.00
Connellsville, foundry, ovens	2.75	2.40	2.25	3.00
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

*1.75-2.25 silicon. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

	July 15, 1933	June 1933	April 1933	July 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.91	1.91
Iron bars, Chicago	1.65	1.65	1.65	1.65
Shapes, Pittsburgh	1.60	1.60	1.60	1.60
Shapes, Philadelphia	1.65	1.65	1.65	1.75
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.60	1.55	1.55	1.60
Tank plates, Philadelphia	1.54½	1.49½	1.49½	1.79½
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.80	1.65	1.55	1.70
Sheets, No. 24, hot ann., Pitts.	2.25	2.10	2.00	2.20
Sheets, No. 24, galvan., Pitts.	2.85	2.70	2.65	2.85
Sheets, No. 10 blue anneal., Chi.	1.95	1.80	1.70	1.85
Sheets, No. 24 hot ann., Chicago	2.40	2.25	2.15	2.35
Sheets, No. 24 galvan., Chicago	3.00	2.85	2.80	3.00
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	2.10	1.85	1.85	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.25	4.75
Scrap				
Heavy melting steel, Pitts.	$12.25	11.65	9.90	8.35
Heavy melting steel, eastern Pa.	10.50	9.50	6.90	6.25
Heavy melting steel, Chicago	10.50	8.80	6.55	4.50
No. 1 wrought, eastern Pa.	11.50	10.25	7.35	6.25
No. 1 wrought, Chicago	10.35	8.10	5.50	4.60
Rails for rolling, Chicago	11.25	10.25	8.50	6.60

Sheets

Shipments Continue Heavy, While New Orders Decline— Some Mills Extending Prices

SHEET PRICES, PAGE 43

Pittsburgh — Despite a decline in new specifications, the trend in sheet operations continues upward, due to releases in the last week in June. One large interest has sufficient backlog to run at 50 per cent until the middle of August. A few contracts have been entered for the third quarter, but the tonnage is insignificant. The initial test on prices is expected to come in the autobody grade, scheduled at 2.60c.

Cleveland — Sheet prices announced recently to apply for July only, with delivery to Aug. 15, now are being quoted by some producers for the remainder of the third quarter. These include 1.80c, base, Pittsburgh, for No. 10 hot rolled annealed; 2.25c for No. 24 hot rolled annealed; 2.85c for galvanized; 2.60c for No. 20 autobody and furniture. However, sellers who quote for the remainder of the quarter are asking 2.45c for No. 10 enameling sheets, $1 over the general current market. The new prices are firm as evidenced by recent moderate sales. Further test will be provided later this month when automotive manufacturers will be required to make new purchases. Mill operations and shipments have not abated.

Chicago — Fairly heavy backlogs permit mills to maintain active operations despite a decrease in new business. Shipments to leading consumers maintain the rate of recent weeks, with little change noted in requirements of the automotive industry. Small gains are shown in orders from farm implement manufacturers, while schedules of electrical refrigerator interests continue heavy.

Philadelphia — Sheet buying is fair, although less than at close of June. Some confusion still exists with regard to prices, particularly the period of their application. While certain producers are quoting the new prices for the remainder of this quarter, others are not quoting beyond July 31.

Buffalo—District sheet mills are operating at 70 to 75 per cent. No slackening is noted in heavy shipments.

New York—Sheet demand here is fairly good. Leading sellers are quoting 2.85c, Pittsburgh, on galvanized sheets, or 3.20c, New York; black at 2.25c, Pittsburgh, or 2.60c, New York; and No. 10 hot rolled at 1.65c, Pittsburgh, or 2.00c, New York. Mill-run, cold rolled No. 10 are 1.95c, Pittsburgh, or 2.30c, New York, and No. 20, 2.40c, Pittsburgh, or 2.75c, New York.

Cincinnati — Sheet mills in this district report new ordering is surprisingly heavy, considering the business done last month. Production is maintained close to 75 per cent. New prices are quoted to Aug. 15 only.

St. Louis—Sheet sales have tapered, following recent heavy specifications for July delivery. Prices are firm.

Boston—New buying of sheets is light and stronger prices have not been tested on tonnage. Shipments against old contracts are active, especially to stove, light tank and refrigerator builders. Jobbers did not cover heavily on sheets far into this quarter at old prices, and some early buying at the higher quotations is expected.

Birmingham, Ala.—All sheet mills are producing steadily. Bookings will warrant continuation of activity for some weeks.

Exports of zinc spelter from Canada in May were 14,166,400 pounds, valued at $363,397, compared with 14,057,800 pounds in April, valued at $338,439, and 18,126,500 pounds valued at $390,760 in May, 1932.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10 (24 to 48 inches wide)

Pittsburgh, base	1.65c
Chi. dist. mills	1.75c
Chicago, del.	1.80c
New York, del.	2.00c
Birm., base	1.80c
Phila., del.	1.96c
St. Louis, del.	1.84c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.80c
Chi. dist. mills	1.90c
Chicago, del.	1.95c
Phila., del.	2.11c
New York, del.	2.15c
St. Louis, del.	1.99c
Birm., base	1.95c
San Fran., c.i.f.	2.27½c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.25c
Chi., dist. mills	2.35c
Chicago, del.	2.40c
New York, del.	2.60c
Phila., del.	2.56c
Birm., base	2.40c
St. Louis, del.	2.59c
San Fran., c.i.f.	2.90c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Chi. dist. mills	2.95c
Chicago, del.	3.00c
Phila., del.	3.16c
New York, del.	3.20c
Birm., base	3.00c
St. Louis, del.	3.19c
San Fran., c.i.f.	3.50c

TIN MILL BLACK No. 28

Pittsburgh, base	2.50c
Gary, base	2.60c
St. Louis, del.	2.84c

MILL RUN COLD-ROLLED

No. 10

Pittsburgh, base	1.95c
Chicago, del.	2.10c
Philadelphia, del.	2.26c
New York, del.	2.30c

No. 20

Pittsburgh, base	2.40c
Chicago, del.	2.55c
Philadelphia, del.	2.71c
New York, del.	2.75c

AUTO. AND FURNITURE

Pittsburgh, No. 10	2.15c
Pittsburgh, No. 20	2.60c

ENAMELING SHEETS

*Pitts., No. 10	2.40c to 2.45c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh

Tin plate, coke base, contract	$4.25
Do., stock	3.75
Long ternes, No. 24 unassorted	2.90c

Gary base, 10 cents higher.

Corrosion, Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.60c
New York, del.	1.60c to 1.70c
Phila., del.	1.49½ to 1.59½
Boston, del.	1.72c to 1.82c
Buffalo, del.	1.85½c
Chicago, base	1.70c
Cleveland, del.	1.80½c
Birmingham, base	1.75c
*†Coatesville, base	1.40c to 1.50c
Pacific Coast, c.i.f.	1.75c
St. Louis, del.	1.94c

†To Aug. 1; thereafter 1.70c.

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, del.	1.65c to 1.75c
New York, del.	1.77c to 1.87c
Boston, del.	1.90½c to 2.00½c
Chicago, base	1.70c
Cleveland, del.	1.80½c
Lackawan., base	1.70c
Birmingham, base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, base	1.75c
Lackawan., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, del.	1.91c
New York, del.	1.95c
Boston, del.	2.02c
Pitts., cold finish	1.70c
Pitts., forg. qual.	1.75 and 1.85c
San Fran., c.i.f.	2.10c

RAIL STEEL

Pitts., Buff.	1.50c
Chicago, base	1.50c
Eastern mills	1.50c

IRON

*Chicago, base	1.60c to 1.70c
New York, del.	1.85c to 1.90c
Philadelphia, del.	1.81c to 1.86c
Pitts., refined	2.70c to 4.20c

REINFORCING

New billet steel, Chi., Pitts., Buff., Cleve., Birm. (cut lengths)	1.75c
Chicago, rail steel	1.50c
Phila., cut lengths	1.86c

Wire Products

(Prices apply on carload lots. Mixed carloads 10 cents higher; joint carloads up 20 cents; less carloads up 30 cents. Nail extras subject to 10 per cent discount on straight or mixed carload shiped to single consignee.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$2.10
Cement coated nails	2.10
Galvanized nails	3.60

(Per pound)

Polished staples	2.80c
Galvanized fence staples	3.05c
Barbed wire, gal.	2.60c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (base column, c.l.)	$55.00

(To Manufacturing Trade)

Plain wire, 6-9 ga	2.10c
Spring wire	3.10c

Anderson, Ind., and Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Cold-Finished Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.70c
20,000 to 59,999 lbs.	1.65c
60,000 to 99,999	1.60c
100,000 lbs. and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c.

Shafting

Cumberland, Md., base

1⅛-inch	3.00c
1 3/16 to 1½-inch	2.50c
1 9/16 to 1⅞-inch	2.20c
2 1/16 to 6-inch	2.05c

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massollon, O. Base 2.45c to 2.65c. Differentials to various classes of consumers.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.30
2500	2.25	3400	3.20

4100 .15 to .25 Mo.	0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	0.20
6100 bars	1.20
6100 spring	0.95
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250 (flats)	0.25
9250 (rds., sq.)	0.50

Strip, Hoops, Bands

*Hot-rolled strip up to 23 15/16-in. wide, Pitts.	1.60c to 1.65c
*Do., Chicago	1.70c to 1.75c
*Do., del. Phila.	2.01c to 2.06c
*Do., del. N. Y.	2.05c to 2.10c
Cooperage hoop, Pittsburgh	1.75c
Do., Chicago	1.75c
Cold-rolled strip Pitts., Cleve.	2.25c
Worcester, 3 tons or over	2.45c

Rails, Track Material

Stand. rails, mill	$40.00
Relaying rails, Pitts., 20-45 lbs.	$22.50 to 25.00
50 to 75	$19.00 to 21.00
80 to 100	$23.00 to 24.00
Light rails, 25-45, mills	$30.00
Light rails, Chi.	$32.00
Angle bars, mills	2.55c
Spikes, R. R. mills	2.40c
Spikes, boat, b'ge, Pitts.	2.65c
Track bolts, Chi.	3.50c
Do., stand. job.	73 off list
Tie plates, Pitts.	$35.00
Tie plates, Chi.	$35.00

Rivets, Wrought Washers

Struc. c.l., Pitts-Cleve.	2.50c
Struc., c.l., Chi.	2.60c
7/16-in. & smaller, Pitts., Chi., Cleve.	70, 10 and 5 off
Washers, c.l., Pitts. dist.	7.35 off
Do., Chi. dist.	7.25 to 7.00 off

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots, Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	73 off
Rolled thread, ½ x 6 and smaller	73 off
Eagle list	73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off

Tire bolts	60 off
Stove bolts, 72½-25-10 off in pkgs.; 85 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller, 73 off.	

NUTS

Semifinished	73 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in. diam., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Cut Nails, Piling

Cut nails, Pitts.; (10% discount on size extras)	$2.65
Do., less carloads, 5 kegs or more; no discount on size extras	$2.90
Do., less than 5 kegs; no discount on size extras	$3.05
Steel piling, Pitts.	1.90c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

All discounts are net.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57
11 and 12	66	56

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

(*Please turn to next page*)

LINE PIPE

Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½
9—10, lap weld	66
11—12, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra. 2-inch line discount unchanged from list prior to April 15, 1933.

BOILER TUBES

C. L. Discounts, f.o.b., Pitts.

*Lap Welded Steel		Charcoal Iron	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts, same as for hot rolled below. Charcoal Iron—Under 10,000 pounds; 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

Cold Drawn

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

Hot Rolled

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs. 40%
15,000 ft. or 22,500 lbs. 70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$35.00-36.00
4-in., Birm.	38.00-39.00
4-in. Chicago	46.40-47.40
6 to 24-in. Chicago	43.40-44.40
6-in. & over, N. Y.	32.00-34.50
4-in. New York	34.50-36.50

Class A pipe $3 over Class B. Stand. fitgs., Birm. base. $90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4, 1932, except Buffalo del. at Boston. Asterisk denotes price change.

Pig Iron

Per Gross Ton

FOUNDRY NO. 2

*Chicago, furnace	$17.00
*Pitts., dist. fur.	17.00
*Pittsburgh, del.	17.63-18.13
*Valley furnace	16.50
*Cleve. fur., loc. del.	16.50
*Philadelphia, del.	17.26
*Virginia furnace	17.25
*Granite City, Ill.	17.00
*St. Louis, del.	17.85
*Buff., fur., local del.	17.00
*Buff., all-rail. Bost.	20.05
*Buff., del. Brook.	18.77
*Buff., del. Newark	17.89
*Ala., Birmingham	13.00
*Ala., del. Chicago	17.16
*Ala., del. St. Louis	17.35
*Ala., del. Cincinnati	17.51
*Ala., Phila., dock	18.00-18.25
*Ala., Balt., dock del.	18.00
*Ala., N. Y. dock	18.50
*Ala., Bost. dock del.	18.50-18.75
*Tenn., Bir. base	14.00
*Tenn., del. Cinci.	17.51
Montreal, del	22.00
*Eastern, del. Phila.	17.76

FOUNDRY NO. 2X

*Buff., fur., local del.	17.50
*Buff., del. Brook.	19.02-19.27
*Do., Newark	18.14-18.39
*Buff., all-rail, Bost.	20.55
*Virginia furnace	17.75
*Eastern, del. Phila.	17.51-17.76

FOUNDRY NO. 1X

*Buff., fur., local del.	18.00
*Eastern, del. Phila.	18.01-18.26
*Buff., del. Brook.	19.52-19.77
*Buff., del. Newark	18.64-18.89

MALLEABLE

*Valley furnace	16.50
*Cleve. fur., loc. del.	16.50
*Pittsburgh dis. fur.	17.00
*Pittsburgh, del.	17.63-18.13
*Chicago, furnace	17.00
*Buff., fur., loc. del.	17.50
*Eastern Pa., del.	18.13-19.91
*Granite City, fur.	17.50
Montreal del.	22.50
Toronto, delivered	21.00

BASIC

*Pitts., dist, fur.	16.50
*Pittsburgh, del.	17.13-17.63
*Eastern Pa., del.	17.00-17.25
*Buff., fur., loc. del.	16.50-17.00
Montreal, del.	22.00
*Valley, furnace	16.00

BESSEMER

*Valley furnace	17.00
*Pittsburgh fur.	17.50
*Pittsburgh, del.	18.13-18.63

LOW PHOS.

*Valley fur. stand.	25.00
*Phila., standard	23.76-27.79
*Copper bear., E. Pa. furnace	23.00-24.00

GRAY FORGE

*Valley furnace	16.25
*Pitts., dist. fur.	16.50
*Pittsburgh, del.	17.13-17.63

CHARCOAL

Lake Sup., del. Chi.	23.04

SILVERY

*Jackson County, O., or Pittsburgh furnace; 6%—$20; 7—$20.50; 8—$21.00; 9—$21.50; 10—$22; 11—$23.

BESSEMER FERROSILICON

*Jackson County, O., or Pittsburgh furnace: 10%—$23; 11—$23.50; 12—$24.00; 13—$24.50; 14—$25.00; 15—$25.50; 16—$26.00.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.00
No. Afr. low phos.	7.00
Swedish basic, 65%	7.50- 8.00
Swedish low phos.	8.00
Spanish, No. Afr. basic, 50 to 60%	7.00
Tungsten, spot, sh. ton unit, duty pd.	$10.75-11.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$16.50-17.50

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	nominal
So. African, 52%	18 to 19 cts.
So. Afr., 49-51%	nominal
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$40.00
Alabama	43.00

Second Quality

Pa., Ohio, Ill., Ky., Md.	35.00
Missouri	35.00
Georgia, Alabama	35.00

MALLEABLE BUNG BRICK

All bases	45.00

SILICA BRICK

Pennsylvania	$40.00
Joliet, E. Chicago	49.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
Unburned	55.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point	$45.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 to 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$11.50
*Washed gravel f.o.b. Ill., Ky., net ton, carloads	$14.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess, Philadelphia	$26.00 31.75
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

*All grades, Pitts.	1.60c

Coke

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$2.00- 2.25
Connellsville fdry.	2.75
Connell, prem. fdry.	4.00
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.21- 8.81
Chi. ov., outside del,	7.50
Chicago, del.	8.25
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.00
*Indianapolis, del.	8.25
*Ashland, Ky., ovens, Connell., basis	5.00
*Portsmouth, ovens Connel. basis	5.00
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	82.00
del. Pitts.	87.24
Spiegeleisen, 19-20%, dom., fur., spot†	27.00
Ferrosilicon, 50%, frieght all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrodhrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb., cont.	0.94- 1.00
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb	0.95
Molybdate, lb. cont.	0.80

†Carloads. Diff. to apply to quantity.

Bars

Shipments Heavy on Recent Specifications—Sales Are Slower—Prices Firm

BAR PRICES, PAGE 43

Cleveland—New bar sales so far in July have fallen below the comparable period of last month, but the demand has been affected relatively less than that for the majority of other finished products by the lull ensuing after heavy specifications of late June. The current market holds at 1.65c, base, Cleveland, with some makers limiting this figure to July 31; and others quoting it for the remainder of the third quarter, with discounts for quantity to be dropped after July 31.

Chicago—Bar shipments continue heavy despite a decrease in new bookings. The decline in sales and specifications following heavy bookings the latter part of June has been less than expected and with backlogs fairly substantial, mills expect to maintain present operations the remainder of this month. Automotive interests continue steady bar consumers and requirements of farm implement manufacturers have been increasing gradually. Mills continue to quote 1.70c, Chicago, on steel bars on July business, contracts for the entire quarter not being accepted. Rail steel bars are steady at 1.70c, while bar iron is quoted 1.70c to smaller users and 1.60c to larger buyers. Bar iron demand from wagon builders is reported the most active in five years.

Pittsburgh—Carbon and alloy bar demand did not increase during the past week but at the same time did not give any indications of a recession. The high rate of automobile production is a material factor. Most contracts at below 1.60c, Pittsburgh, are certain to be specified by the end of this month.

Boston—Demand for commercial steel bars has improved, bolt and nut users having increased specification. Shipments of special alloy bars and tool steels are also better. Prices on commercial steel bars are steady at 1.60c, Pittsburgh.

New York—While all sellers of commercial steel bars are holding to Aug. 1 as the deadline on preferential tonnage, some have extended the time on which shipments must be made to the end of August. Others are accepting only such specifications at preferential prices as they can deliver by Aug. 15.

Philadelphia—Preferential buyers of steel bars are being advised by sellers that after July 31, 1.60c Pittsburgh, or 1.91c, Philadelphia, will be rigidly applied on specifications over the remainder of this quarter. Meanwhile releases are holding well, with railroad requirements an increasingly important feature. Common iron bar prices are 1.50c, Pittsburgh, or 1.81c, Philadelphia.

Tin Plate Specifications Continue Heavy

Tin Plate Prices, Page 43

Pittsburgh — Tin plate specifications during the early part of this month have not reflected any reduction in demand despite the heavy orders in June. The feature of the market is the continued brisk export business. Increasing amounts of such business have come from Japan and at least two European countries. Operations last week averaged 95 per cent. There is a disposition to cut off extra turns, despite pressure from canmakers for deliveries.

Cold-Finished Backlogs Heavy; Auto Needs Lead

Cold Finished Prices, Page 43

Pittsburgh—Producers of cold-finished steel bars still have good backlogs as a result of heavy general buying and additional specifications received during the current month. Consistent buying has come from the automobile trade.

Plates

Demand Holding for Tank, Ship, Railroad and Brewery Work—July Ends Preference

PLATE PRICES, PAGE 43

Pittsburgh — In plates as well as in shapes, 1.60c, Pittsburgh, for August and September will mark an advance to large users. Plate tonnages have been increasing, due to river, tank and demands for railroad repair parts. Thus far orders for new equipment have been small. Producing mills are now operating at a better rate than at the beginning of July.

Cleveland—Plate mills here now are operating at capacity on specifications released late in June. Production represents a diverse demand, with railroads sharing to a small extent. Brewery tank requirements continue the largest outlet. The fabricator at Elyria, O., is working 24 hours a day. Companies producing power for public consumption are showing more interest in boiler requirements. The market is 1.60c, base, Pittsburgh, for third quarter, discounts to large buyers to be dropped July 31.

Chicago—Plates gradually are becoming more active, aided by substantial tank business from breweries, a scattering of tank construction for oil companies and an increase in freight car repair work. The outlook for additional tank business from breweries continues favorable, in view of pending work. Between 2000 and 3000 tons of plates have been involved in brewery tanks placed over recent weeks. For a Logansport, Ind., brewery 600 tons have been placed. Oil companies are more active in repair work and some new tanks have been awarded, including 600 tons for Shell Petroleum Corp.

St. Louis—After a long period of quiet steel plates show improvement. More activity is noted in requirements of the petroleum industry.

Boston—Effective Aug. 1, a leading plate mill will take no business under 1.70c, Coatesville, Pa. During the remainder of this month orders will be booked at current prices, which are mixed, the minimum for one mill being 1.50c, Coatesville, although considerable business is going below that price.

New York—Plate buying is increasing as the first deadline on tonnage at present prices, July 31, approaches. Indications point to general application of 1.70c, Coatesville, Pa., effective Aug. 1. Franklin, Pa., is expected to inquire soon for a steel tank to take 100 tons of plates.

Philadelphia—With leading plate sellers quoting 1.70c, Coatesville, Pa., as their price to all buyers, effective Aug. 1, plate specifications continue to come out freely. Railroads, particularly the Pennsylvania,

are showing increasing interest and oil companies and ship yards are figuring more actively. Prices higher than those scheduled to go into effect next month are reported as being quoted shipbuilders figuring on navy ships on which construction bids are to be opened July 26, because deliveries are expected to be extended over at least two years.

Contracts Placed

800 tons, 60-inch steel pipe, metropolitan district commission, installation at Medford, Mass., to Walsh's Holyoke Steam Boiler Works, Holyoke, Mass.; Cenedella & Co., Milford, Mass., general contractor.

600 tons, tanks, Shell Petroleum Corp., at Wood River, Ill., to Chicago Bridge & Iron Works, Chicago.

600 tons, tanks, Schmidt Brewing Co., Logansport, Ind., to Graver Tank & Mfg. Corp., East Chicago, Ind.

400 tons, tanks, Croft Brewery, Boston, to Riverside Boiler Works, Cambridge, Mass.

290 tons, intake towers, Boulder Dam, Boulder City, Nev., to unnamed interest; general contract to John W. Beam Co.

250 tons, tanks, Atlantic Refining Co., Philadelphia, to Chicago Bridge & Iron Works, Chicago.

100 tons, tanks, Publicker Commercial Alcohol Co., Philadelphia, to Chicago Bridge & Iron Works, Chicago.

100 tons, standpipe, Sturbridge, Mass., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Contracts Pending

1790 tons, tunnel lining for metropolitan water district, Los Angeles; bids opened.

Railroads

Car Repairs Take More Steel; Rail Buying Is in Prospect

Track Material Prices, Page 43

Rail buying is slow but a number of moderate tonnages are in prospect for early closing. The Erie is expected to release 6000 tons and the Nickel Plate 2300 tons on last year's contracts. Chesapeake & Ohio is expected to place a rail order during third quarter. Rail backlogs are being worked off by all mills.

Enlarged repair programs are bringing inquiry for further steel supplies. The Pennsylvania plans to repair 5150 freight cars this month and is in the market for steel to cover this need. Some delay has been experienced in obtaining shipment of needed material to keep up with shop work. Imminence of the crop movement in the West and Northwest is spurring efforts to have cars ready.

Track fastenings shipments are fairly active. Scullin Steel Co., St. Louis, is low on 10,000 tie plates for the Panama railroad, on bids taken July 10. Relaying rails are strongly held, especially in light weights.

Cudahy Packing Co., Chicago, has placed parts for 200 sets of car underframes with the Pullman Car & Mfg. Co., Chicago.

Wire

Production Increasing; Plain Wire Prices Extended

Wire Prices, Page 43

Chicago—Shipments of manufacturers' wire and wire products continue fairly heavy with specifications moderately less active than during late June. Mills have fair backlogs and expect steady operations for several weeks. Requirements of the automotive industry are well maintained. Wire nails are $2.15 in carload lots with plain wire 2.15c.

Pittsburgh — Operations in wire mills are trending upward, due to recent specifications. Much business is believed to have been placed before recent advances in merchant wire products. Business booked so far at $2.10 per keg for nails and at the advance for other merchant products has been small.

Cleveland—All wire and wire products prices now are being quoted for the remainder of the third quarter by leading producers. This includes plain wire to the manufacturing trade at 2.10c, Pittsburgh-Cleveland; and 3.10c for spring wire, as well as nails and other products on which prices recently were advanced $5 a ton. The market is quieter, with shipments on June specifications continuing heavy.

Boston — Wire mill operations have been enlarged. Buying was heavy against anticipated higher prices. Some consumers are anxious for delivery. An advance in manufacturers' wire is expected, but new prices on other wire products have not been tested. Advances have been made on numerous specialties.

Strip

Large Bookings Swell Output; New Price Not Yet Tested

STRIP PRICES, PAGE 43

Cleveland—New sales and specifications for strip have moderated, though shipments continue heavy, mills having backlogs to support present rate of operations well into August. Producers generally are quoting 2.25c, base, Cleveland, for cold rolled. Though 1.65c, base, Pittsburgh, was the announced price for third quarter, 1.60c is being done by some sellers.

Pittsburgh—Heavier shipments of strip were made by strip producers in June compared with May, and the high rate of production has continued this month. Mills are well booked for the remainder of the month at least, at former prices. Bookings at the new levels of 1.65c, Pittsburgh, on hot-rolled and 2.25c on cold-rolled, have been small.

New York—New prices announced for shipment in this quarter appear to be taking hold, with hot strip 1.65c, Pittsburgh, or 2.00c, New York, and cold-rolled 2.25c, Pittsburgh, or 2.60c, New York. While less brisk than a month ago, specifications are coming out freely.

Chicago—Slowing of new business the past week failed to disturb production which is supported by heavy June bookings. Requirements of leading consumers, including the automotive industry, are well maintained. New business in cold-rolled strip is light, due to previous coverage, and mills have little occasion to quote the 2.25c, Pittsburgh-Cleveland price. Hot-rolled strip is 1.75c, Chicago.

Boston—Heavy covering on cold-rolled strip has delayed tests of the 2.45c, Worcester, price. Specifications are heavy and strip mills in several instances are operating near capacity, especially on narrow widths. Some of the larger buyers bought rather heavily late last month and some at under 2.20c, Worcester.

Philadelphia — Most strip sellers are quoting on a basis of 2.25c, Pittsburgh, or 2.56c, Philadelphia, on cold-rolled for shipment to Oct. 1 and 1.65c, Pittsburgh, or, 1.96c, Philadelphia, on hot strip. The new prices have not been effectively tested.

More Iron Ore Sales

Iron Ore Prices, Page 44

Cleveland—Iron ore sales are more frequent, and some of the leading consumers have increased their estimated requirements.

Receipts of iron ore at Lake Erie ports in June totaled 886,876 tons, compared with 116,112 tons in the month last year. Shipments from the ports to interior furnaces during the month were 865,579 tons, against 265,845 tons last year. Stocks on Lake Erie docks at the close of June

amounted to 4,788,748 tons; at the same time last year they were 5,374,337 tons. Receipts at other lake ports in June totaled 343,360 tons; last year, 105,194 tons.

Trade Publications

WELDING EQUIPMENT — Hobart Bros. Co., Troy, O., has published a bulletin describing and illustrating its line of electric welding equipment.

LININGS—Stebbins Engineering & Mfg. Co., Watertown, N. Y., has published a bulletin on acid, alkali and corrosion-resisting linings for industrial equipment.

ELECTRICAL EQUIPMENT—General Electric Co., Schenectady, N. Y., has issued several bulletins, including those devoted to steam turbines for mechanical drive, lead-sheathed imersion units for heating corrosive baths, low speed alternating-current generators and totally enclosed squirrel-cage motors.

CHAIN—Chain Belt Co., Milwaukee, has published two folders devoted to various types of chains, including detachable, pintle and conveyor chains, roller and snake chains, Z-metal chains, steel roller chains, etc. Illustrations show the various types.

BLOWERS — Roots-Connersville-Wilbraham, Connersville, Ind., has published a bulletin describing a small type direct-coupled blower and motor. Another bulletin by the same company discusses a blower for handling gases and vapors.

PORTABLE TESTING MACHINE—Linde Air Products Co., 30 East Forty-second street, New York, has published a booklet describing portable tensile testing machine for testing welds. Details of construction and directions for operation are contained.

MANOMETERS—Several types of direct-reading manometers are described in three bulletins recently published by the Bacharach Industrial Instrument Co., 7000 Bennett street, Pittsburgh. Each bulletin presents a discussion of the construction of the manometer, information on its use and specifications.

MECHANICAL RUBBER GOODS—A bulletin recently published by the B. F. Goodrich Rubber Co., Akron, O., describes a soft elastic rubber, black in color, used as a protection to other surfaces from abrasion of wet or dry materials. It is pointed out that the rubber can be attached to any surface with mastic tar.

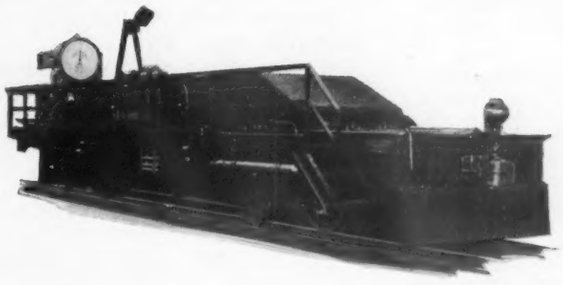
HEATING UNITS—A bulletin, No. CA-106, by Edwin L. Wiegand Co., Pittsburgh, describes electric heating units of the immersion type, space heaters, electric ring units, etc. Reproduction of photographs show the application of various heating units to numerous industrial operations.

CHIPPING HAMMERS—Four sizes of chipping hammers are illustrated in a bulletin by the Dallett Co., 165-189 West Clearfield street, Philadelphia. Chipper repair parts are illustrated. A second bulletin gives information on metalworking chisel blanks for use with the chipping hammers made by that company.

SPEED REDUCER — Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has published a bulletin describing a unit consisting of electric motor and built-in speed reducer. A unit of the same type which permits speed operations with a constant-speed electric motor is described in another bulletin. Illustrations include several applications and detailed views of each model. Tables of output speeds for each model are included.

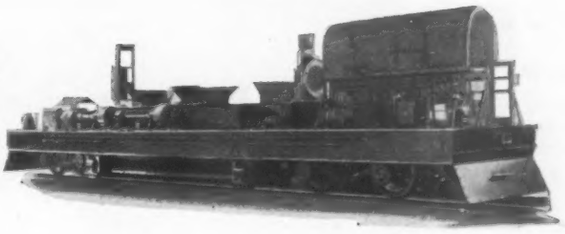
ELECTRIC HEATING—General Electric Co., Schenectady, N. Y., has published a catalog on electric heating units and devices. Information is presented on immersion heaters, cartridge units, strip heaters, helical sheath-wire heating units, cast-in hotplates, metal melting pots, gluepots, soldering irons, industrial air heaters and control equipment.

ATLAS SCALE CARS



Double Compartment Bottom Dump Scale Car. Scale of All Steel construction equipped with Atlas Indicating Dial and Recorder.

20 Ton Capacity Double Compartment Scale Car. Orr type Bin gates controlled from operator's station on scale car.



Other Atlas Products

Gas-Electric and Diesel-Electric Locomotives—Car Pushers—Storage Battery Locomotives—Electrically Operated Industrial Cars—Scale Cars and Weighing Cars of all kinds — Ore Transfer Cars and Blast Furnace Charging Cars.

Coke Oven Equipment

Pushers and Levelers—Coal Charging Cars—Door Handling Machines — Coke Quenching Cars.

Also Atlas Patented Indicating and Recording Mechanism for Weighing Scales.

THE ATLAS CAR & MFG. CO.

Engineers *Manufacturers*

CLEVELAND, OHIO

Structural Shapes

Market Is Quieter, with Few Substantial Awards — Inquiries Lacking — Eastern Market Is Stronger—Bethlehem May Be Made Single Basing Point in East

STRUCTURAL SHAPE PRICES, PAGE 43

New York — Structural steel demand is light, supported mainly by a few brewery projects. Several large federal construction jobs in the East are being rushed for early bids. The last section of the Manhattan west-side elevated highway may be out shortly. Two brewery buildings account for 2800 tons. Fabricators as a rule are not covering ahead on plain material requirements, but buy as they take contracts. After July, plain shapes will be 1.60c, Pittsburgh, to all buyers.

Pittsburgh — The outlook for the shape business is improving. Makers did not add to their backlogs last month but are receiving better specifications this month. Large consumers will be asked to pay the full 1.60c price for August and September. They are protected through July at prices they had on old contracts.

Cleveland — For bridges in five Ohio counties, requiring approximately 300 tons of shapes, the state will open bids July 28, the first letting this year. Plans have been completed for an auditorium at Oberlin college, taking 200 tons, though the project remains to be financed. Substantial tonnages of sheet piling are pending for port work at Port Huron, Mich., Toledo, O., and Buffalo. Many small jobs are being figured here.

Chicago — Structural shape demand is marking time, pending the release of public work. Awards and inquiries are few, involving only small lots. New bids will be asked for a 1500-ton bridge at Justice Park, Ill., although funds for this work still are not available.

Philadelphia—Indications point to the elimination of the Pencoyd, Pa., base, with Bethlehem as the sole eastern basing point. While this, it is believed, would give Pittsburgh producers freer action in this district, eastern producers would be compensated by a more stable market than has existed when not only Pencoyd, but upon occasion, other producing points in the East were used as base. With eastern producers announcing their intention of quoting 1.70c in the East, effective Aug. 1, releases are improving, as the 1.70c price will represent an increase of $2 a ton over the present Pencoyd price, and more to local buyers, should the Bethlehem base be applied to shipments here. The Pennsylvania railroad is understood to be speeding action on its electrification program.

Boston—Structural steel demand continues light, with a few small projects active, including 385 tons of piling for a New Hampshire bridge substructure. The superstructure for this bridge will take a substantial tonnage. After Aug. 1 plain material will be 1.60c, Pittsburgh, to all buyers.

Contracts Placed

2100 tons, building, Ruppert Brewery, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.; through New York Steel Corp.; William Kennedy Construction Co., general contractor.

600 tons, building, Burke brewery, Long Island City, N. Y., to American Bridge Co.; George A. Fuller Co., general contractor.

500 tons, building, Publicker Commercial Alcohol Co., Philadelphia, to Morris Wheeler & Co., Philadelphia; S. H. Levin, general contractor, that city.

381 tons, four barges for Union Sand & Gravel Co., Huntington, W. Va., to McClintic-Marshall Corp., Bethlehem, Pa.

375 tons, grade crossing, New York Central railroad, Corning, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh.

315 tons, highway bridges, Colorado, divided among three fabricators.

285 tons, radio shrine, Royal Oak, Mich., to R. C. Mahon Co., Detroit.

250 tons, S. S. Kress Co. stores, Hutchinson, Kans., to Kansas City Structural Steel Co., Kansas City, Mo.

240 tons, warehouse, Scholler Bros., Philadelphia, to American Fabricated Steel Co. Inc., Philadelphia; W. L. Lotz, that city, is general contractor.

200 tons, highway bridges, Indiana, to Central States Bridge & Structural Co., Indianapolis.

175 tons, building, Oldbury Chemical Co., Niagara Falls, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

160 tons, trestle, Excelsior Motor Mfg. & Supply Co., Chicago, to American Bridge Co., Pittsburgh.

125 tons, mostly piling, bulkhead, Jenney Mfg. Co., Chelsea, Mass., to Carnegie Steel Co., Pittsburgh; Coleman Bros., Boston, general contractors.

Shape Awards Compared

	Tons
Week ended July 15	**5,706**
Week ended July 8	**25,406**
Week ended July 1	**13,290**
This week in 1932	**14,451**
Weekly average, 1932	**14,285**
Weekly average, 1933	**14,964**
Weekly average, June	**12,878**
Total to date, 1932	**454,530**
Total to date, 1933	**433,982**

Contracts Pending

3500 tons, bridge, Yorktown, Va.; bids postponed to July 21; also takes 300 tons of concrete bars and 500 tons of wire for cable.

1750 tons, addition, Rockefeller Institute, New York.

1500 tons, bridge, Justice Park, Ill.; new bids to be asked.

1500 tons, estimated, state bridge, Dover-Newington, N. H.; bids in on substructure.

710 tons, tunnel lining for metropolitan water district, Los Angeles; bids opened.

900 tons, bridge, Culbertson, Mont.

400 tons, farm machinery building, state fair grounds, Syracuse, N. Y.; Wright & Kramers Inc., Niagara Falls, N. Y., low.

400 tons, kitchen building, City hospital, Boston; to John Bowen Co., general contractor. Structure may be redesigned for concrete.

380 tons, piling, substructure, bridge, Dover-Newington, N. H., Central Enneering & Construction Co., Pawtucket, R. I., low. Contract also requires about 125 tons of reinforcing bars.

300 tons, approximate, state bridges in Ashland, Clermont, Jackson, Clinton and Licking counties, Ohio; bids to department of highways, Columbus, July 28.

300 tons, horticultural building, state fair grounds, Syracuse, N. Y.; Royal Rice Inc., New York, low.

200 tons, postoffice, court house and custom house, New Bern, N. C.; Murch Bros. Construction Co., St. Louis, low.

200 tons, postoffice, Portsmouth, O.; R. B. McDanel, New Brighton, Pa., low.

170 tons, high school, New London, Conn.; steel to be placed through Topper & Griggs.

170 tons, shapes and plates, Panama, United States Steel Products Co., New York, and Central Iron & Steel Co., Harrisburg, Pa., low.

150 tons, building, United States Infirmary National Home for Lepers, Carlville, La.; Murch Bros. Construction Co., St. Louis, low.

125 tons, postoffice, Big Springs, Tex.; Algernon Blair, Montgomery, Ala., low.

100 tons, addition, postoffice, Charlottesville, Va.; R. W. Ericksen, Philadelphia, low.

100 tons, postoffice, Lewiston, Me., Nicholas Vallani, Staten Island, N. Y., low.

During May Japan imported 36,604 tons of steel through the ports of Kobe, Osaka and Yokahama, a gain of about 8800 tons over April.

Plans for amalgamation of iron and steelworks in Japan are progressing and statistics are before the government for consideration.

Concrete Bars

Further Action on Public Works Programs Awaited—Requirements Restricted to Small Lots — Ohio Taking Bids on 1000 Tons of Road and Bridge Work

REINFORCING BAR PRICES, PAGE 43

Chicago — While an increase in new reinforcing bar business to a large extent awaits release of public works projects, producers are busier on old orders. Purchases of small miscellaneous lots are more active. Mills are protesting against the adoption by the state of Illinois of a new type of metal expansion joint which reduces reinforcing bar requirements about 2 tons per mile. Producers have large stocks of bars cut to state specifications which are said to be unsuitable for other uses.

Pittsburgh — Business is being booked in small lots. No change in price has developed here. More active demand is anticipated for late summer in view of prospects for improved public works.

Cleveland—The Cleveland reinforcing bar producer is now covering specific jobs beyond July at 1.50c base, Cleveland, mill lengths of new billet steel. Road and bridge projects on which Ohio is taking bids July 28 require approximately 1000 tons of bars. Interest here is centered on an incinerator project for Cleveland, requiring 300 tons; bids, July 24. Small orders are fairly plentiful.

Boston—Connecticut highway requirements and a Boston city hospital building are the principal concrete reinforcing projects pending. The 1.75c, Pittsburgh, price on cut lengths hold fairly well on small lots.

Philadelphia—Placing of 205 tons of bars for a hospital at Sayre, Pa., is outstanding. However, the Pennsylvania railroad is expected in the near future to not only release a substantial tonnage against old contracts for its west side development here, but to award 2000 tons in addition.

New York—Following the recent award of most of the larger tonnages in this district, the market for concrete bars is dull. Prices are unchanged at 1.75c, Pittsburgh, for cut lengths, on the general run of small orders.

Contracts Placed

250 tons, building, George A. Hormel Co., Austin, Minn., to Calumet Steel Co., Chicago; additional to 500 tons previously reported.

205 tons, hospital, Sayre, Pa., to Kalman Steel Corp., Bethlehem, Pa.

185 tons, ⅝-inch highway bars, highway, Eagle Grove, Iowa, to Des Moines Steel Co.; Inland Steel Co., Chicago, to fabricate. O'Rourke Construction Co., Des Moines, general contractor.

125 tons, state school buildings, Wassaic, N. Y., to Milton Mfg. Co., Philadelphia; through W. E. Wark Co.

100 tons, bars and piling, bridge, Housatonic river, Sandy Hook, Conn., bars to Concrete Steel Co., Boston, piling to Jones & Laughlin Steel Corp., Pittsburgh; Lee Construction Co., Boston, general contractor.

Contracts Pending

2033 tons, including 1100 tons of wire mesh, pipe line at El Centro, Calif., for Imperial-Intercities water district; Applied for loan from Reconstruction Finance Corp.

1000 tons, approximate, various road and bridge projects in Ohio; bids to department of highways, Columbus, July 28.

895 tons, specification 3143, water and power bureau, Los Angeles; bids July 11.

593 tons, sewers in Wilton Place district, Los Angeles; plans being prepared.

350 tons, grade crossing, Erie railroad, Elmira, N. Y.

300 tons, bridge, Yorktown, Va.; bids postponed to July 21; also takes 3500 tons of shapes and 500 tons of wire for cable.

300 tons, kitchen building, City hospital, Boston; John Bowen Co., Boston, low. Project may be redesigned for concrete, taking substantially more bars.

200 tons, mesh, highway projects, Connecticut.

140 tons, Irish-American Home, San Francisco; bids July 14.

Nakayama steel works in Japan has completed equipment for production of wire rods at about 5000 metric tons per month, about two-thirds of which will be used for wire manufacture by the producer and the remainder sold.

Concrete Awards Compared

	Tons
Week ended July 15	**740**
Week ended July 8	**5,832**
Week ended July 1	**5,945**
This week, 1932	**2,549**
Weekly average, 1932	**3,920**
Weekly average, 1933	**3,100**
Weekly average, June	**2,406**
Total to date, 1932	**121,439**
Total to date, 1933	**89,922**

Stable Industry a Goal, Says Verity

GEORGE M. VERITY, chairman of the board of the American Rolling Mill Co., Middletown, O., under the title, "Stabilization," has expressed some thoughts on the current industrial situation. Excerpts follow:

It has been said that: "Change is the law of life and the hand of stabilization is the hand of death."

There is no denying that change is the law of life, but when we come to speak of stabilization we must qualify our statement. Are we referring to absolute stabilization of every factor to which it can be applied, or do we simply mean greater stability as compared to the wild fluctuations which have prevailed in every phase of our economic lives?

As far as stabilization of industry is concerned it would not be humanly possible to plan for a fixed operation of all units, for a fixed consumption of any products or for a fixed distribution of all products; stabilization in human affairs cannot be effected to any such extent.

Industrial stabilization can only come through an intelligent effort to better harmonize production and consumption. Consumption of everything that civilization has made desirable can be and must be increased throughout the world, but consumption is a mighty force that must make progress slowly.

Better standards of working, better compensation for useful work, and higher standards of living must precede greater consumption in the backward nations of the world, but it can be done. If these backward nations could simply enjoy what we would consider a most simple code of living, the least that could be considered civilized, it would take the industry of the world a hundred years or more to meet the demand so created.

Consumption of all standard goods throughout the world is, however, a known quantity from year to year, and that sort of stabilization which will make for more uniform employment will be the result of keeping production within the reasonable bounds of known consumption, whatever it can be made to be from period to period.

A sound, sensible, practical stabilization of all our activities is a most desirable goal.

Pittsburgh Screw & Bolt Co., Pittsburgh, reports loss of $79,147 in April, loss of $56,840 in May, but a profit of $45,924 in June.

Pipe

Boiler Tube Prices Advanced $8 to $12 a Ton—Some Tonnages of Cast Placed in East

PIPE PRICES, PAGE 43

Cleveland—New base discounts on cold drawn and hot rolled seamless boiler tubes are being issued by manufacturers, advancing prices approximately $8 to $12 a ton. The market for steel pipe here is quieter, jobbers having covered ahead liberally at the close of the second quarter.

Chicago—Cast iron pipe is quiet, awaiting the inauguration of work on which federal loans are being asked. Some of this business is expected to appear shortly. A large tonnage is involved in old orders placed for sanitary district work in Chicago, completion of which was deferred over the past year. Colorado Springs, Colo., has placed a water line involving about 1000 tons of steel.

Pittsburgh — Pipemakers have backlogs for shipment well into August, a substantial amount of business having been driven in by recent advances. The most active grade is standard pipe. Demand from the oil fields is quiet and no change is noted in mechanical tubing. Boiler tube discounts have been reduced four to six points, advancing prices $8 to $12 per ton.

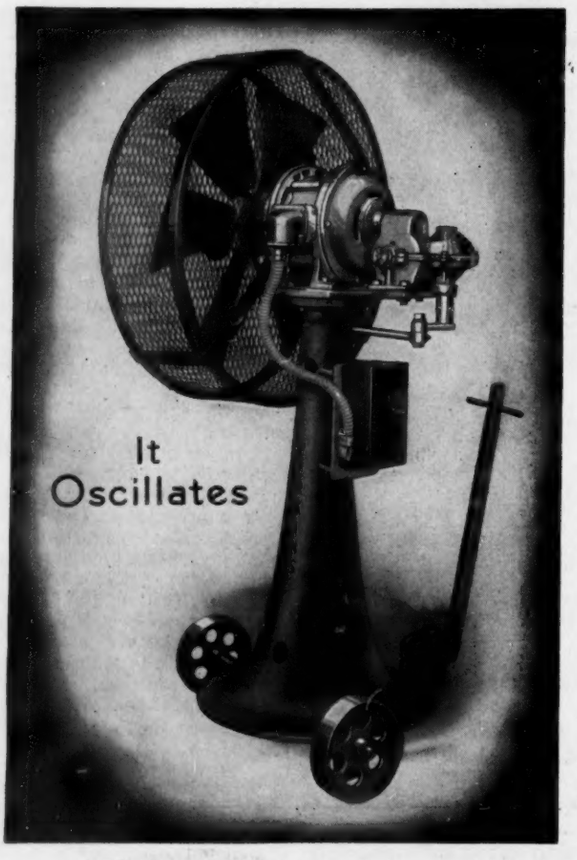
Colorado Springs, Colo., has awarded 1000 tons of pipe to the National Tube Co.

Birmingham, Ala.—Pipe production has been increased here and award of considerable more tonnage is anticipated.

New York — New York city has bought 250 tons of cast pipe and is expected in the market shortly for close to 1000 tons for yard stocks. A New Jersey utility has bids on about 250 tons of 8-inch. Other active inquiries are light, including several New York state projects, one taking 500 tons. Eastern foundries are endeavoring to obtain $36, foundry, for pipe in this territory, but this has not been subjected to much test.

Boston—Mills have been doing a heavier volume with jobbers on merchant steel pipe. Some good business has also been done on cast pipe, the local foundry booking about 2400 tons, from the Boston metropolitan district commission and Sturbridge, Mass. Prices on small lots are steady, but larger inquiries bring out concessions.

PERKINS Man Coolers
Reduce Operating Costs



Oscillating and Stationary Types—Hundreds of users of Perkins Man Coolers have proven for themselves the wisdom of investment in Perkins Man Coolers.
Readily moved from place to place, they bring comfort to men working in hot places, resulting in decreased labor turnover, increased production and fewer accidents.

B. F. Perkins & Son, Inc.
Engineers and Manufacturers
HOLYOKE, MASS.

Cast Pipe Placed

7740 tons, 6 to 12-inch class 250, Los Angeles. Allocated as follows: To American Cast Iron Pipe Co., Birmingham, Ala., 2340 tons; to United States Pipe & Foundry Co., Birmingham, 2300 tons; to National Cast Iron Pipe Co., Birmingham, 1600 tons; to R. D. Wood & Co., Emaus, Pa., 1500 tons.

1950 tons, 10 to 16-inch, Boston metropolitan district commission, Holden to Rutland, Mass., to Warren Pipe Co., Boston, J. J. Coughlan & Sons Inc., general contractors.

1630 tons, 20-inch, Norwalk, Conn., to United States Pipe & Foundry Co., Burlington, N. J.

825 tons, 16-inch and under, Warwick, R. I., to United States Pipe & Foundry Co., Burlington, N. J.

500 tons, 12-inch, Milwaukee, to United States Pipe & Foundry Co., Burlington, N. J.

250 tons, 6 to 12-inch, New York city, divided, Donaldson Iron Works, Emaus, Pa., and United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 6 and 10-inch, Puyallup, Wash., to American Cast Iron Pipe Co., Birmingham, Ala., and Pacific Water Works Supply Co., Seattle.

450 tons, 4 to 8-inch, Sturbridge, Mass., to Warren Pipe Co., Boston.

Cast Pipe Pending

1000 tons, yard stocks, New York city, department of water supply, gas and electricity to ask bids soon.

240 tons, 8-inch, Public Service Corp. of New Jersey, Newark, for installation at Harrison, N. J.

200 tons, small sizes, Kings Park hospital, New York; bids in.

Steel Pipe Pending

Unstated tonnage, 105,600 feet, small sizes, Panama, United States Steel Products Co., low, $10,542; bids July 10, schedule 2880.

Unstated tonnage, 1100 steel boiler tubes, Panama; Globe Steel Tubes Co., Milwaukee, low; bids July 10.

Bolt, Nut Shipments Heavy; Rail, Implement Needs Grow

Bolt, Nut, Rivet Prices, Page 43

Selling of bolts, nuts and rivets has decreased, because of heavy specifications on second quarter contracts before the new prices went into effect. Shipments are active. Automobile manufacturers have covered requirements for the life of present models. Prices are quoted only a month at a time. Railroad demand tends upward but is irregular. Farm implement manufacturers are taking heavier shipments. The current price on bolts and nuts is 73 off and on rivets 2.50c, Pittsburgh and Cleveland. and 2.60c, Chicago.

Semifinished Steel Shipments Heavy

Semifinished Prices, Page 44

Finishing mills are drawing heavily on producers of semifinished steel. The trend of output in many nonintegrated mills still is upward, with consequent increased demands for sheet bars, slabs and billets. The movement this month is expected to be as good, if not better than in June. Prices are firm.

Fluorspar Advanced

Fluorspar Prices, Page 44

Leading producers of fluorspar have increased their quotation on washed gravel—85 and 5—in carloads in bulk—to $14 per ton, at all Illinois and Kentucky mines.

Loadings of Western Roads Gain 14.3 Per Cent in June

Revenue freight loadings of seven leading western railroads during June were 14.3 per cent larger than during the corresponding 1932 month, and 6.4 per cent greater than during May. This compares with a decrease of 18.3 per cent from the corresponding 1932 period in March. May loadings were 5 per cent heavier than a year ago. June traffic still was 23 per cent less than in June, 1931. Despite the gains during the past two months loadings for the first half of this year were 7.8 per cent fewer than during the first six months of 1932, and 30.8 per cent below the 1931 figure.

Pre-Coated
STRIP STEELS
for your product
ZINC COATED
COPPER COATED
• To the workability, gauge and temper uniformity and fast continuous production features of cold rolled strip steel, Thomas adds the advantages of pre-coating with non-ferrous metals. Sales appealing appearance, rust resistance and the bond for product finishes are thus provided at low cost . . . Thomastrip pre-coating, as electrically applied by the Thomas method, is crack and peel-proof under deep drawing and severe forming. Uniformity, non-porosity and fine appearance characterize Thomas specialized production. Test Thomastrip for your product. Send for test samples — specify gauge, width, temper and coat desired.
ELECTRO COATED
ThomaStrip
COLD ROLLED STRIP STEEL
The THOMAS STEEL CO.
WARREN OHIO
SPECIALIZED PRODUCTION COLD ROLLED STRIP STEEL

Scrap

Prices Strong and Holders Await Advance—Buying Lull Delays Test of Real Level

Pittsburgh—Purchase of a substantial tonnage of heavy melting steel by the leading interest at $12.50 for various points in the Pittsburgh district marks an increase of 25 cents in price. Some moderate lots were bought by other users. At one local point $12.25 was paid and at another $12.50. Report is current here that steel on the Baltimore & Ohio list brought $12.80, Youngstown, O., and there was belief that a price near that level might have been realized on Pennsylvania scrap. No. 1 cast has been stronger and a firm tone has continued in blast furnace materials. Specialties have sold as high as $14, due to moderately increased demand from foundries.

Chicago—Heavy melting steel has advanced 75 cents a ton on a small

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.00 to 9.00
Boston, dealers	6.00 to 6.50
Buffalo, No. 1	10.00 to 11.00
Buffalo, No. 2	9.00 to 9.50
Chicago	10.25 to 10.75
Cleve., No. 1	9.50 to 10.00
Cleve., No. 2	9.00 to 9.50
Det., No. 1	8.75 to 9.25
Det., No. 2	7.75 to 8.25
E. Pa., del mill	10.00 to 10.50
E. Pa., No. 2 del.	9.00 to 9.50
Federal, Ill.	8.75 to 9.25
Granite City, Ill.	7.50 to 8.00
N. Y., deal. R. R.	7.50
N. Y., deal. No. 2	6.50
N. Y. deal. yd.	2.50 to 3.00
Pitts., No. 1	12.00 to 12.50
St. L. No. 1 del.	9.00 to 9.50
Valleys, No. 1	13.00

COMPRESSED SHEETS

Buffalo, dealers	9.00 to 9.50
Chi. (Factory)	8.50 to 9.00
Cleveland	9.00 to 9.50
Detroit	8.75 to 9.25
E. Pa. new mat.	9.00 to 9.50
Pittsburgh	11.75 to 12.25
Valleys	12.50

BUNDLED SHEETS

Buffalo	5.50 to 6.00
Cincinnati, del.	5.50 to 6.00
Cleveland	7.00 to 7.50
Eastern Pa.	7.50 to 8.00
Pittsburgh	10.75 to 11.25
St. Louis	4.50 to 5.00

SHEET CLIPPINGS LOOSE

Chicago	4.50 to 5.00
Cincinnati	4.50 to 5.00
Detroit	5.00 to 5.50
St. Louis	4.00 to 4.50

STEEL RAILS SHORT

Birmingham	10.50 to 11.00
Boston, dealers	5.00 to 5.50
Buffalo	12.00 to 12.50
Chicago (3 ft.)	11.50 to 12.00
Chicago (2 ft.)	12.00 to 12.50
Cincinnati, del.	11.00 to 11.50
Detroit	11.00 to 11.50
Pitts. (open-hearth, 3 ft. and less)	12.50 to 13.00
St. Louis	10.50 to 11.00

STOVE PLATE

Birmingham	7.00 to 7.50
Boston, dealers	3.50 to 4.00
Buffalo	8.75 to 9.25
Chicago, net	7.50 to 8.00
Cinci., deal. net	5.50 to 6.00
Detroit, net	4.00 to 4.50
Eastern Pa.	8.00 to 8.50
N. Y. deal. Fdry.	5.50
St. Louis	7.00 to 7.50

COUPLERS, SPRINGS

Buffalo	11.00 to 11.50
Chicago	11.00 to 11.50
Eastern Pa.	11.00 to 12.00
Pittsburgh	13.50 to 14.00
St. Louis	8.50 to 10.00

ANGLE BARS—STEEL

Chicago	11.00 to 11.50
St. Louis	9.00 to 9.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50 to 12.50
Cleveland bil. and bloom crops	12.00 to 13.00
Eastern Pa.	12.00 to 13.00
Pittsburgh billet bloom crops	13.75 to 14.25
Pitts., sheet bar crops	13.75 to 14.25

FROGS, SWITCHES

Chicago	10.50 to 11.00
St. Louis	9.50 to 10.00

SHOVELING STEEL

Chicago	10.25 to 10.75
Cleveland	6.25 to 6.50
St. Louis	9.00 to 9.50

RAILROAD WROUGHT

Birmingham	7.00 to 7.50
Boston, dealers	2.00 to 2.50
Buffalo, No. 1	6.50 to 7.00
Buffalo, No. 2	10.00 to 11.00
Chi., No. 1, net	9.00 to 9.50
Chi., No. 2	10.25 to 10.75
Cinci., No. 2	8.50 to 9.00
Eastern Pa.	11.00 to 11.50
N. Y., No. 1 deal.	5.50 to 6.00
Pitts., No. 1	11.75 to 12.25
St. Louis, No. 1	6.00 to 6.50
St. Louis, No. 2	8.50 to 9.00

SPECIFICATION PIPE

Boston	3.00 to 4.00
Eastern Pa.	9.00
N. Y., deal.	3.25 to 3.75

BUSHELING

Buffalo, No. 1	9.00 to 9.50
Chicago, No. 1	8.50 to 9.00
Cinci., No. 1 deal.	6.00 to 6.50
Cinci., No. 2	3.00 to 3.50
Cleve., No. 2	7.00 to 7.25
Det., No. 1 new	7.25 to 7.75
St. Louis, No. 1	5.25 to 5.75
Val. new No. 1	12.00 to 12.50

MACHINE TURNINGS

Birmingham	3.00 to 3.25
Boston, dealers	3.50 to 3.75
Buffalo	6.25 to 6.75
Chicago	6.00 to 6.50
Cinci., deal.	5.50 to 6.00
Cleveland	6.75 to 7.00
Detroit	5.75 to 6.25
Eastern Pa.	7.50
N. Y., deal.	4.00 to 4.25
Pittsburgh	8.75 to 9.25
St. Louis	3.00 to 3.50
Valleys	10.75 to 11.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	3.25 to 3.50
Buffalo	6.50 to 7.00
Cinci., deal.	5.50 to 6.00
Cleveland	7.25 to 7.50
Detroit	6.00 to 6.50
Eastern Pa.	7.00
N. Y., deal.	4.00 to 4.25
Pittsburgh	9.00 to 9.50

CAST IRON BORINGS

Birming., chem.	8.50 to 9.50
Birming., plain	3.00 to 3.25
Boston, chem.	5.50 to 6.00
Boston, dealers	3.25 to 3.50
Buffalo	6.25 to 6.75
Chicago	6.00 to 6.50
Cinci., deal.	5.50 to 6.00
Cleveland	7.25 to 7.50
Detroit	6.00 to 6.50
E. Pa., chem.	10.00 to 12.00
N. Y., deal.	4.00 to 4.25
Pittsburgh	9.00 to 9.50
St. Louis	3.50 to 4.00

PIPE AND FLUES

Cinci., deal.	4.00 to 4.50

RAILROAD GRATE BARS

Buffalo	5.00 to 5.50
Chicago, net	7.50 to 8.00
Cincinnati	5.00 to 5.50
Eastern Pa.	8.00 to 8.50
N. Y., deal.	4.50 to 5.00
St. Louis	6.00 to 6.50

FORGE FLASHINGS

Boston, dealers	4.00 to 4.50
Buffalo	8.75 to 9.25
Cleve. ov. 10 in.	8.25 to 8.50
Detroit	7.00 to 7.50

FORGE SCRAP

Boston, dealers	4.00 to 4.50
Chicago (heavy)	11.50 to 12.00
Eastern Pa., del.	8.00 to 9.00

ARCH BARS, TRANSOMS

Chicago, net	8.00 to 8.50
St. Louis	8.50 to 9.00

AXLE TURNINGS

Boston, deal.	4.00 to 4.25
Buffalo	7.50 to 8.00
Chi., elec. fce.	8.00 to 8.50
Cleveland	6.75 to 7.00
Eastern Pa., del.	9.00
St. Louis	4.00 to 4.50

STEEL CAR AXLES

Birmingham	9.00 to 9.50
Boston, ship. pt.	8.00 to 8.50
Buffalo	10.00 to 11.00
Chicago, net	11.50 to 12.00
Eastern Pa.	15.50
St. Louis	9.25 to 9.75

SHAFTING

Boston, ship. pt.	9.00 to 9.25
Eastern Pa.	14.00 to 15.00
N. Y., deal.	10.00 to 10.25
St. Louis	7.50 to 8.00

CAR WHEELS

Birming., iron	9.00 to 9.50
Boston, iron deal.	5.50 to 6.00
Buffalo, iron	8.00 to 9.00
Buffalo, steel	11.00 to 11.50
Chicago, iron	9.50 to 10.00
Chi., rolled steel	11.00 to 11.50
Cincinnati, iron	8.50 to 9.00
E. Pa., iron	11.00 to 11.50
E. Pa., steel	11.50 to 12.00
Pitts., iron	11.00 to 11.50
Pitts., steel	13.50 to 14.00
St. Louis, iron	8.00 to 8.50
St. Louis, steel	9.50 to 10.00

NO. 1 CAST SCRAP

Birmingham	8.00 to 8.50
Boston, No. 2	4.00 to 4.50
Boston, textile	8.00 to 8.50
Buffalo, cupola	9.50 to 10.00
Buffalo (mach.)	10.50 to 11.00
Cleve. cupola	10.00 to 10.50
Chi., mach. net	8.75 to 9.25
Chi., railroad net	8.50 to 9.00
Cinci., mach. cup.	9.00 to 9.50
Cleve. cupola	10.00 to 10.50
Detroit, net	8.50 to 9.00
E. Pa., cupola	10.50 to 11.50
N. Y., cup. deal.	6.00 to 6.50
N. Y., del. local foundries	9.00 to 9.50
Pitts., cupola	11.25 to 11.75
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. Louis, No. 1	8.25 to 8.75
St. L. No. 1 mach.	7.75 to 8.25

HEAVY CAST

Boston, del.	4.75 to 5.25
Bost., mach. cast	7.00 to 7.50
Buffalo, break.	7.00 to 7.50
Cleve., break	7.00 to 7.50
Detroit, auto net	9.00 to 9.50
Detroit, break.	6.50 to 7.00
Eastern Pa.	9.50 to 10.00
N. Y., No. 1, deal.	6.00 to 6.50
N. Y., break. deal.	5.75 to 6.25
Pittsburgh	9.50 to 10.00

MALLEABLE

Boston, consum.	9.50 to 10.00
Buffalo	11.50 to 12.00
Chicago, R. R.	11.00 to 11.50
Cinci., agri. del.	8.50 to 9.00
Cinci., R. R. del.	9.00 to 9.50
Cleveland, rail	10.00 to 10.50
Detroit, auto	8.50 to 9.00
St. Louis R. R.	8.50 to 9.00

RAILS FOR ROLLING
5 feet and over

Birmingham	8.50 to 9.50
Boston, deal.	6.00 to 6.50
Buffalo	9.00 to 9.50
Chicago	11.00 to 11.50
Eastern Pa.	11.00
New York, dealer	7.00 to 7.25
St. Louis	10.00 to 10.50

LOCOMOTIVE TIRES

Chicago, cut	10.00 to 10.50
St. L., No. 1	7.50 to 8.00

LOW PHOS. PUNCHINGS

Buffalo	11.00 to 11.50
Chicago	11.00 to 11.50
Eastern Pa.	12.00 to 13.00
Pittsburgh	13.25 to 13.75

sale to one mill at $10.75. Buying has been confined principally to small lots with dealers unwilling to go short on large tonnages in view of the scarcity at recent prices. Railroads are disposing of only small lists and many holders are retaining their accumulations in anticipation of even higher levels. Quotations on a number of grades have been advanced 50 cents a ton, with most railroad products stronger.

Cleveland—Collectors of steel and iron scrap are firm in refusing to sell at present quotations and are not tempted by offers $1 higher. As a result some grades are scarce. Water shipments from Detroit and Indiana Harbor, Ind., continue to arrive. These are negotiated directly from producer to consumer. Prices are firm but in the absence of tonnage sales they are unchanged. Dealers are unable to sell into the future under present conditions.

New York—Demand for scrap is active, buying covering a broader movement with loading for barge shipment heavy. Prices on several grades have advanced $1 or more. The Buffalo district and Sparrows Point, Md., are taking good shipments. Higher domestic prices have tended to retard new business for export as some buyers are reluctant to follow the rising market.

Detroit—Demand for iron and steel scrap for outside shipment, especially to the Canton-Massillon district, continues insistent. Local melters continue to take in material. The Rotary Electric Steel Co., a new producer, is accumulating scrap for operations beginning late in August. Many grades are up 25 to 50 cents, No. 1 steel and compressed sheets now being $8.75 to $9.25.

Cincinnati — Scrap prices tend sharply upward. Heavy melting steel is bringing $8.50 to $9 from dealers, a rise of 75 cents.

St. Louis—Activity and strength continue in iron and steel scrap. Heavy melting steel is in especially good demand, sales the past several days totaling 10,000 to 12,000 tons. Heavy melting steel prices are advanced 50 cents per ton to $9.50.

Boston — Advances in several grades of scrap, brought about by higher bids for outside shipment, has resulted in higher delivered prices to New England consumers. For No. 1 heavy melting steel Worcester, Mass., is now paying $7.75 to $8, delivered, and $1 less for No. 2.

Philadelphia — Due primarily to apparent shortage of heavier grades of scrap rather than to buying, eastern Pennsylvania scrap prices have undergone a further general advance. Momentarily No. 1 heavy melting steel is holding at $10 to $10.50, delivered, although the top price is the more representative.

Buffalo — Narrowing of quoted ranges on scrap is reported. Production of many grades especially for blast furnace use, continues small and tends to restrict trading. Scrap is firmly held.

Birmingham, Ala.—Active demand is noted in scrap with offers by consumers not being accepted freely. Dealers are slow to sell far into the future. Prices are firm with upward inclination.

Toronto, Ont.—Trading in iron and steel scrap is gaining slowly. Local dealers continue to report a good movement of steel scrap on export account, but no shipments to Canadian melters. No. 1 machinery cast is moving more freely in small lots and supplies are limited. Dealers are out of the market and have made no change in price.

Canada imported 2,587,500 pounds of alumina, including bauxite ore, from the United States in May. Antimony to the extent of 33,600 pounds was imported. Imports of tin in blocks, and pigs in May totaled 208,500 pounds from the United States.

Pipe Is Fabricated From Stainless-Clad Steel

Stainless-clad steel, a recent development which has created considerable interest on account of its adaptability for use as an economical corrosion resistant, now is being welded successfully for pipe work. Much research work has been carried on in spiral welding of pipe with the stainless surface on either the interior or the exterior of the pipe.

According to R. C. Ingersoll, president, Ingersoll Steel & Disc Co., Chicago, a division of the Borg-Warner Corp., there is complete assurance of a perfect weld, and the stainless portion of the weld has the same corrosion resisting properties of the stainless surface of the pipe. It is said that for pipe and plate work the stainless layer may comprise from 5 to 50 per cent of the total thickness of the metal, depending upon the pressures and degree of corrosion resistance demanded.

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Pig Iron

Third Quarter Price Marked Up $1 Per Ton in All Districts—Silicon Differentials Adjusted

PIG IRON PRICES, PAGE 44

Cleveland—Producers cite recent advances in coal and coke prices, and expectations that blast furnace wages will be raised before the expiration of the third quarter, as reasons for the general increase of $1 a ton in pig iron prices, lifting the Cleveland furnace base to $16.50 for local and outside shipment. New bookings for the week increased slightly to approximately 5000 tons. Shipments continue upward.

Otis Steel Co., preparing to blow in its second stack, purchased 10,000 tons of basic iron from the Ford Motor Co., for delivery in July. Corrigan, McKinney Steel Co. is operating its fourth stack; and one may be lighted at Toledo, O., late this month.

Pittsburgh — Advance of $1 per ton in pig iron in Pittsburgh and the valley came as somewhat of a surprise, though the market was strong for several weeks. In some quarters an advance had been anticipated and orders placed. Shipments continue at an excellent rate.

Chicago—Shipments still tend upward and from present indications the July movement will be heavier than that of June. A slight lull has developed in new buying, this being ascribed to an advance of $1 a ton announced recently on No. 2 foundry and malleable. These grades now are quoted $17, furnace. Silicon differentials also have been advanced, the rate now being 25 cents for each 25 points compared with 25 cents for each 50 points previously. Farm implement manufacturers are engaged principally in production of repair parts and iron requirements are rather light.

Philadelphia — Prices here have been advanced $1 a ton on shipments over the remainder of the quarter. New silicon differentials also have been established on foundry iron with an additional 25 cents for every 25 points of silicon from 2.25 up to 4.25 per cent. Under new prices foundry iron with silicon up to 1.75 is quoted at $16.25, furnace; 1.76 to 2.25 silicon, $16.50. From this point on the new differentials apply. In addition to a $1 increase in eastern Pennsylvania prices on foundry, basic and malleable, southern producers have also announced a similar increase on their delivered dock prices, now holding at $18 to $18.25.

Boston — Mystic Iron Works has followed the $1 advance in prices to $17, base, including higher silicon differentials. Business will be booked through third quarter at this price. Sales are light following recent purchases by several textile machinery plants.

Buffalo—The $1 a ton advance in all grades of iron made here takes effect immediately, and has checked purchases rather sharply. However, shipments continue to increase. Hanna Furnace Corp. is preparing to light a merchant stack here, prior to Aug. 1, and is having a second furnace relined for future operations.

Birmingham, Ala.—Pig iron prices here have been advanced $1 per ton. Sales are still active, mostly small tonnages for immediate delivery. Woodward Iron Co. blew in a furnace a week ago and Republic Steel Corp. expects to blow in its second furnace at Thomas by Aug. 1.

Toronto, Ont. — Demand for merchant iron is showing steady improvement. Melters are entering the market more frequently, but are not placing future delivery contracts. The daily melt has been stepped up to about 35 per cent, with indications of further improvement.

St. Louis — Prices have been advanced $1 per ton by the leading local producer and southern blast furnaces supplying this territory. Silicon differentials are now split, 25 cents additional per ton for every 25 points over 2.25 per cent, and 25 cents less for every 25 points under 1.75 per cent silicon. In anticipation of the advance, buying was active.

Cincinnati—Quotations were advanced $1 a ton in this district, effective Thursday. Northern iron is now $17, base, Hamilton, O., or $18.01, base, delivered Cincinnati. Southern iron also was advanced $1, and quotations are 50 cents less than northern iron. Silicon differentials are now 25 cents for 25 points, instead of for 50 points, as heretofore.

New York—Prices are $1 a ton higher here, with northern producers

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of foundry iron applying new silicon differentials. It is believed that fourth quarter prices, when announced, will be still higher, although decision may not be reached for some time. Buying continues restricted.

Coke

Higher Prices Appearing as Wages Rise—Shipments Gain

Coke Prices, Page 44

Advances in labor rates are forcing higher prices in the beehive coke market, although demand in itself has imparted strength. Spot foundry now appears to be at a minimum of $2.75, with $3 also quoted. The most common quotation on spot furnace is $2.25 although there may be some contracts still out at lower figures. Some bids of more than $2.25 are reported, with light offerings. Production of by-product coke in this district is all being taken.

Foundry coke shipments tend upward at Chicago. Consumers are covered for second half although prices are being set on a monthly basis. July quotations are $7.50, ovens, for outside delivery and $8.25, delivered Chicago.

Foreign Ferromanganese Shaded in Eastern Market

Ferroalloy Prices, Page 44

Domestic sellers of ferromanganese continue to quote $82, eastern seaboard, on car lots for spot and contracts for delivery in this quarter. One seller of foreign ferromanganese is quoting this price on less than carlots which represents a concession of $7 under the domestic price on less-than-carlots. This material is being furnished from stocks in this country. On carlot quantities this seller is quoting on delivery from abroad in 30 days. Each transaction is a matter of individual negotiation due to the constant variation in exchange. Spot domestic spiegeleisen, 19 to 21 per cent, is unchanged at the new price of $27, furnace.

Canada in May exported 2,763,900 pounds of aluminum to the United Kingdom and 182,000 pounds to the United States. Aluminum scrap to a total of 135,100 pounds was exported to the United States.

Sixty Apply to Scrap Institute

SIXTY new applications for membership in the Institute of Scrap Iron and Steel have been received during and since the annual convention of the institute in Chicago last week, according to Benjamin Schwartz, director general of the institute.

These applications consist chiefly of former members who are seeking reinstatement in the institute, in addition to a group of new firms. Through the intensive work of membership committees in each of the 13 chapters, the officers of the institute expect that the membership of the institute will be increased by more than 100 additional names before the code of fair competition for the scrap iron industry will be put into effect.

Outstanding among membership committees is the work of the New Jersey chapter committee, headed by Richard V. Bonomo. Within the period of one week, this committee cleaned up the accounts of 17 members, placing them in good standing in the institute, and added five new firms to the roster of the New Jersey chapter. The other members of the New Jersey committee include J. J. Brady, Barney Rubine and M. Kunin.

David H. Cohn, chairman of the membership committee of the St. Louis chapter, has added 15 names to the membership list of his chapter by placing in good standing many former members and adding several new firms.

A dozen additions to the Cleveland-Detroit chapter are the result of the work of Ben Newman, chairman of the membership committee of that chapter.

The team work of the membership committee of the New York chapter, consisting of George Betten, chairman; Morris Machlin and John L. Spitzer, resulted in the addition of 10 names to the rolls of that chapter.

Interstate commerce commission has vacated 20 orders against railroads for recapture of excess earnings under the Transportation act, a result of repeal of the recapture provision of the act. Secretary of the Treasury Woodin is now returning $13,000,000 paid into

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the railroad revolving fund. Roads against which orders were issued include Richmond, Fredericksburg & Potomac Railroad; Wyandotte Terminal Railroad Co.; Tuckerton Railroad Co.; R. J. Darnell, lessee of the Batesville Southwestern Railroad; Central Railway Co. of Arkansas; Oil Fields Short Line Railroad Co.; Lake Terminal railroad; Hannibal Connecting.

Japanese Steel Company To Expand in Manchuria

The Japanese government has authorized the recently organized Showa Steel Works to take over the Anshan operation in Manchuria and to expand production facilities, according to a report received in the iron and steel division of the commerce department, Washington from the Tokyo office.

A new plant which is to be built will produce pig iron, ingots, bars and various steel materials. The bulk of the plant's production is expected to be consumed in Manchuria, the report stated, although some export business is expected to the markets in China and the South Seas. Shipments to Japan are expected to be confined to the necessary amounts to make up deficiencies in Japanese domestic production.

A new tin plate plant is under construction in Yokohama and is expected to start production in August. It will have a rated capacity of about 20,000 metric tons annually. In addition the Government Steel Works expects to increase the capacity of its tin plate plant by about 50,000 tons.

Men of Industry

(*Concluded from Page* 19)

pany's office recently opened in the Magnolia building, Dallas, Tex.

□ □ □

V. H. Todd, Swedish Iron & Steel Corp., 17 Battery Place, New York, has left on a trip to Sweden.

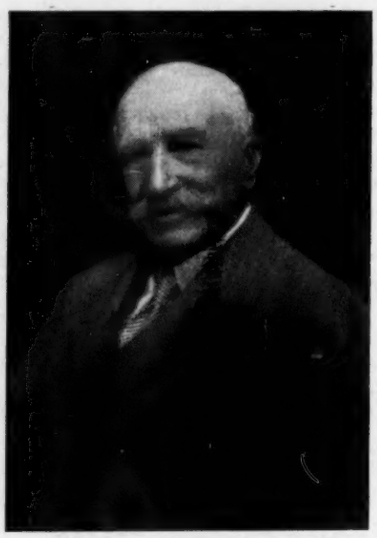
□ □ □

Harry Ross Jones, who resigned recently as president of the Ohio Ferro Alloy Co. and was formerly president of the United Alloy Steel Corp., is understood to have been engaged by a Mahoning valley steel company to organize an alloy steel division for the manufacture of a complete line of automotive and other alloy products.

John D. Jones, a brother, formerly with the Central Alloy Steel Corp. and the Rustless Iron Corp. in the Detroit district, is expected to be the representative in the Detroit district for the new alloy steel department of this company.

□ □ □

William Royse Lysaght, who was elected president of the Iron and Steel Institute of Great Britain, at its meeting in London, May 4-5, be-



William Royse Lysaght

gan his career in 1874 at the works of the Gospel Oak Co., in Tipton, Staffordshire, then the principal maker of galvanized iron in Great Britain. In 1878 he became connected with John Lysaght Ltd., of Bristol, Somersetshire, which is now the largest manufacturer of sheets, black and galvanized of all descriptions, in Great Britain.

□ □ □

Frederick H. Payne has resumed his post as chairman of the Greenfield Tap & Die, Corp., Greenfield Mass., which he resigned in May, 1930, to become assistant secretary of war.

□ □ □

Albert J. Saute, for the past seven years associated with the General Electric Co. as time study engineer, has been made foundry superintendent for L. F. Fales Machinery Co., Walpole, Mass.

□ □ □

Sewell L. Avery, president of the United States Gypsum Co. and Mont-

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Chicago, Ill.

H. L. Brown,
2001 Carew Tower
Cincinnati, Ohio

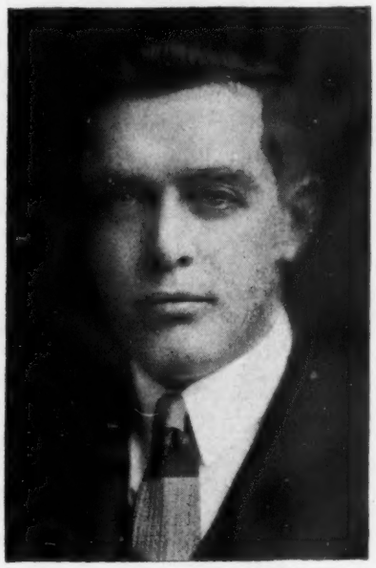
gomery, Ward & Co., Chicago, and a director of the United States Steel Corp., has been made a director of Pullman Inc., Chicago, as well as of the transportation subsidiary of that company, Pullman Co.

□ □ □

R. A. Weaver, president, the Ferro Enamel Corp., Cleveland, and E. H. Weil, president, Vitreous Steel Products Co., Cleveland, have been elected to the executive committee of the Porcelain Enamel institute.

□ □ □

V. S. Veenman, formerly foundry



Rudolph Furrer

Former A. O. Smith Corp. director of research, now assistant to all operating vice presidents of National Tube Co.

foreman for the Superior Bronze & Aluminum Co., Warren, O., and later foundry superintendent for the France Foundry & Machine Co., Toledo, O., has accepted a similar position with the Nolte Brass Foundry at Springfield, O. Mr. Veenman is in charge of bronze bushings and general jobbing castings.

Equipment

Miscellaneous Buying Holds Pace—No Large Lists

Boston—Textile machinery builders are the busiest in New England, several operating close to capacity with a good backlog. Under the textile code, details as to mill operations will probably result in equipment changes, a development which has already brought about a hurried demand for new and some used textile machinery. Most shops are more active, but on lighter and special equipment largely. Stanley P. Rockwell Co., Hartford, booked a gas-fired carburizing machine and automatic temperature control for the Springfield, Mass., arsenal shops.

New York—Miscellaneous inquiry for machinery and equipment is slightly heavier, although there are no large lists out. Dealers and builders, however, are figuring more business, interest being confined almost entirely to special tools. An eastern manufacturer of water meters is inquiring for a few tools and some inquiry is heard from plants who have displayed no interest in new equipment in several years. The small list for the 207th street subway shops remains unplaced.

Chicago—Moderate gains continue to be noted in activity in machinery and plant equipment, with sales lagging somewhat behind the betterment noted in a number of other districts. Demand has increased principally among small items and inquiry is concerned largely with this type of equipment. Machine tool sellers report moderately heavier orders, most of which involve single items. Interest in used equipmant is fairly active and also is limited principally to smaller machines. A few inquiries for machinery for the navy are appearing after a recent period of deferred purchases. City of Chicago is attempting to obtain federal aid for schools which may result in the purchase of a fairly large number of machine tools for manual training shops.

Cleveland—Inquiries for steel mill equipment have fallen off slightly from the June rate, although the market is still active. Purchase orders are confined to small amounts, as mills are turning available funds into production material rather than plant maintenance. Outlook for the summer is good. Machine tools are moving at a fair rate, although sales are mostly for single units and spread over a wide range of industries. Higher prices for most tools and equipment continue to be held off pending functioning of the recovery act.

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Warehouse

Sales Volume Holds Well; Price Trend Is Upward

Cleveland—The volume of warehouse business here so far this month is little changed from the June rate. Some jobbers noted a slight reduction in sales during the week. Demand is well diversified. Common and cement coated wire nails have been advanced 15 cents a keg to $2.35, with other prices continuing firm.

Chicago—Boiler and structural rivets have been advanced 25 cents, to 3.00c. Tank rivets have been advanced from 70 off list to 65 off. Prices on other products are unchanged. Business continues active.

New York—With few exceptions volume with warehouse distributors is slightly below the June rate. Higher prices for sheets are now effective, but quotations on other products are unchanged.

Cincinnati—Volume of warehouse orders is well maintained at the June rate, the best of 1933. Demand continues diversified.

Detroit—Warehouse sales of iron and steel are on a parity with June, which registered an encouraging gain over May and preceding months. Mill deliveries on some products, especially wide sheets, are becoming so delayed that users are canvassing warehouses. Mill price adjustments have not yet been reflected in warehouse levels, though a rise in galvanized sheets is a likely possibility.

St. Louis—Though somewhat irregular iron and steel warehouse business is heavy and the usual seasonal slackness is not evident. Highway, river and other outdoor engineering work take considerable material.

Philadelphia—Warehouse demand is being fairly well sustained. Prices are unchanged, although an advance in some items, particularly in sheets, may develop.

Boston—Warehouse volume here is running 15 to 20 per cent below last month. In other New England districts the June rate is more closely maintained. Prices are steady and unchanged.

Canadian Construction Up

Construction contracts awarded in Canada in June increased 24 per cent over May, reaching $8,000,000. Residential construction was heavier than in June, 1932, there was a moderate improvement in industrial construction, with a falling off in business structures.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials, except reinforcing and Swedish bars)

STEEL BARS □

Baltimore*	2.45c
Boston††	2.50c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New Orleans	2.50c
New York‡ (d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.50c-2.60c
Portland	3.00c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS □

Baltimore	2.35c
Boston††	2.70c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS □

Baltimore	2.35c-3.00c
Boston	3.10c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.00c-2.45c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
New Orleans	2.75c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.50c-2.60c
San Fran. cl.	2.00c
San Fran. lcl	2.40c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES □

Baltimore*	2.45c
Boston††	2.60c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES □

Baltimore*	2.45c
Boston††	2.60c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼ in. and thicker	2.95c
Cleve., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New Orleans	3.50c
New York (d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE □

Baltimore*	2.70c
Boston††	2.35c
Buffalo	3.10c
Chattanooga	3.44c
Chicago	2.75c
Cincinnati	3.05c
Cleveland	2.75c
Det., 8-10 ga.	2.90c
Houston	3.35c
Los Ang.	3.80c
New Orleans	3.25c
New York	3.00c
Portland	4.00c
Pitts.**	2.60c
San Fran.	3.75c
Seattle	3.50c
St. Louis	3.00c-3.15c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK □

Balt.*†	3.25c
Boston††	3.45c
Buffalo	3.25c
Chattanooga	3.50c
Chicago	3.45c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.30c
Los Ang.	4.20c
New York	3.65c
Pitts.**	3.35c
Portland	4.50c
San Fran.	3.70c
Seattle	4.25c
St. Louis	3.60c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS □

Balt.*†	3.75c
Buffalo	3.75c
Boston††	4.00c
Chattanooga	3.95c
Chicago	3.75-3.85c
Cincinnati	4.00c
Cleveland	3.85c
Detroit	3.50c
Houston	3.57c
Los Ang.	4.50c
New Orleans	4.25c
New York	4.00c
Pitts.**	3.60c-3.85c
Portland	5.00c
San Fran.	4.30c
Seattle	4.75c
St. Louis	3.75c
St. Paul	4.19c
Tulsa	5.10c

†BANDS □

Baltimore	2.75c
Boston††	3.00c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New Orleans	2.75c
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.20c

†HOOPS □

Baltimore	2.65c
Boston	4.90c
Buffalo	3.55c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.65c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

COLD FIN. STEEL □

Baltimore (c)	3.33c
Boston (g)	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3.15c
Los Ang.	5.50c
New Orleans	4.25c
Philadelphia	3.35c
Pittsburgh	2.95c
Portland (f)	4.50c
San Fran.(d)	5.50c
Seattle (f)	4.50c
St. Paul	3.20c
St. Louis	3.36c
Tulsa	4.65c

COLD ROLL. STRIP □

Boston 0.100 in., 500 lb lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex, only.
(b) Net base straightening, cutting boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) Bessemer analysis extras included.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, New York, Chicago, Pittsburgh Cincinnati, Chattanooga and St. Louis on heavier lines are subject to new quantity differentials: 399 pounds and less, up 50c; 400 to 999 pounds, base; 1000 to 4999 pounds, 20c off; 5000 to 9999 pounds, 40c off; 10,000 to 39,999 pounds, 60c off; 40 000 pounds and over 75c off.

Pacific Coast

Prices Being Advanced on Some Lines—Current Selling Is Slow —Pipe Tonnages Move More Freely — Prospective Needs Promise Business for Near Future Closing

San Francisco—(*By Air Mail*)—Although only three awards involving 100 tons or over were placed during the week prices are firming and advances were named in at least two commodities. Nails are up $2 a ton, to 2.40c, base, f.o.b. cars. The advance in pipe ranges as high as $7 a ton on smaller sizes.

It is reported but not confirmed that 2400 tons of reinforcing bars for a pier and quays at Pearl Harbor, T. H., and 250 tons for a torpedo warehouse there have been placed. Planned projects include 2033 tons for a water pipe line at El Centro, Calif., and 593 tons for a sewer system in Los Angeles. Out-of-stock prices hold at 2.05c, base, on carload lots.

Unnamed interests booked 290 tons of plates for intake towers at Boulder dam, the general contract going to John W. Beam Co. Los Angeles has opened bids on 1790 tons for tunnel lining. Prices are unchanged at 1.75c, c.i.f.

Los Angeles has opened bids on 710 tons of shapes for tunnel lining. The largest pending project involves 30,000 tons of transmission lines for bureau of power and light, Los Angeles, bids July 14. Wide flange material holds at 2.20c, c.i.f., with standard shapes quoted at 2.10c.

Los Angeles has awarded 7740 tons of 6 to 12-inch cast iron pipe to the following companies; 2340 tons to the American Cast Iron Pipe Co., 2300 tons to the United States Pipe & Foundry Co., 1600 tons to the National Cast Iron Pipe Co. and 1500 tons to R. D. Wood & Co. This is the largest award so far this year. No award has been made on 1595 tons for San Francisco, on which the Central Foundry Co. is low.

Seattle Market Firm

Seattle—Firmness of the Pacific Northwest market is indicated by an increase from 1.80c to 2.10c on plates, announced this week by the Columbia Steel Co. Bars and shapes remain 2.10c and 2.20c for wide flange. Nails are up 2.00c and Portland jobbers have advanced all gages of sheets. Seattle jobbers have not revised their lists but increases are expected.

Bids will be opened next week for the Alderwood Manor, Wash., pipe line involving 1400 tons of plates. Other materials also will be considered. For a local brewery project, bids July 11, about 200 tons of structurals will be required. Berg Shipbuilding Co., Seattle, was low at $289,890 for construction of a 231-foot steel motorship for the Northland Transportation Co., Seattle. Oregon state bridge department is completing plans for five proposed bridges along the coast, involving a heavy steel tonnage.

Steel in Europe

Markets Quiet, Confident; Comptoirs Deciding Prices

London—(*By Cable*)—Production of pig iron in June was 345,600 tons, compared with 339,900 tons in May, a gain of 5700 tons. Steel production, on the other hand, at 568,800 tons for June, showed a decline of 30,800 tons from May. Imports and exports of iron and steel in June were lower than in May; imports were 69,019 tons in June and 84,900 tons in May; exports were 153,787 tons in June, 178,600 tons in May.

The iron and steel trade generally is quietly confident and conditions are much improved over last year. One Scottish firm is planning to construct a blast furnace. Some Belgian steel is entering the British market. Australia and South America are buying tin plate. The Continent reports markets are quiet. Great Britain is buying some wire rods. The market in the Far East is fairly active. Comptoirs still are negotiating on c.i.f. prices and special low prices for the British market. The German steel trust, Vereinigte Stahlwerke, is being broken up into four separate concerns.

Lead in pigs was exported from Canada in May to a total of 34,993,000 pounds, compared with 25,745,900 pounds in April and 17,323,900 pounds in May, 1932.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, July 13

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON		£ s d		£ s d
Foundry, 2.50-3.00 Silicon	$13.95	2 18 6	$8.27	1 14 0
Basic bessemer	12.88	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	14.07	2 19 0	.....	.....
SEMIFINISHED STEEL				
Billets	$23.85	5 0 0	$11.44	2 7 0
Wire rods, No. 5 gage	35.78	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$36.97	7 15 0	$26.77	5 10 0
Merchant bars	1.41c	6 12 6	.66c	3 0 0
Structural shapes	1.57c	7 7 6	.61c	2 15 0
Plates, †¼ in. or 5 mm	1.76c	8 5 0	.86c	3 18 6
Sheets, black, 24 gage or 0.5 mm.	1.92c	9 0 0	1.29c	5 17 6
Sheets, gal., 24 gage, corr.	2.34c	11 0 0	1.60c	7 5 0
Bands and strips	1.65c	7 15 0	.80c	3 12 6
Plain wire, base	1.86c	8 15 0	1.18c	5 7 6
Galvanized wire, base	2.24c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.56c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 4.11	0 17 3	.....	.....

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($45.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$14.91	3 2 6*a	$11.32	200	$11.97	300	$21.58	63
Basic bessemer pig iron	14.07	2 19 0*	11.04	195	11.97	300	23.80	69.50
Furnace coke	3.16	0 13 3	6.79	120	4.39	110	6.59	19.25
Billets	23.85	5 0 0	22.92	405	17.56	440	33.05	96.50
Standard rails	1.76c	8 5 0	1.81c	697	1.98c	1,100b	2.05c	132
Merchant bars	1.46c	6 17 6	1.46c	500	.96c	535	1.71c	110
Structural shapes	1.86c	8 15 0	1.43c	550	.96c	535	1.67c	107.50
Plates, †¼-in. or 5 mm.	1.81c	8 10 0	1.77c	680	1.22c	675	1.97c	127
Sheets, black	2.13c	10 0 0‡	2.21c	850‡	1.35c	750‡	2.23c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.66c	12 10 0	3.77c	1,450	2.61c	1,450	5.74c	370
Plain wire	1.86c	8 15 0	2.94c	1,130	2.34c	1,300	2.74c	177
Bands and strips	2.02c	9 10 0	1.61c	620	1.22c	675	1.97c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price.
British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel.
a del. Middlesbrough. b Since January

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 9.00c, Conn., for copper

Sheets	
Yellow brass (high)	14.00
Copper, hot rolled	15.62½
Lead sheets, cut to jobbers	8.25
Zinc sheets (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	15.87½
Seamless copper	16.12½
Rods	
Yellow brass (high, full turning)	11.75
Naval brass	11.87½
Anodes	
Copper, untrimmed	14.00
Wire	
Yellow brass (high)	14.25

Old Metals

Dealers' buying prices, cents lb

No. 1 Composition Red Brass	
New York	5.00 to 5.25
Chicago	5.00 to 5.25
Cleveland	5.75 to 6.25
St. Louis	4.75 to 5.00
Heavy Yellow Brass	
New York	3.75 to 4.00
Heavy Copper and Wire	
New York	6.75 to 7.00
Chicago, No. 1	6.25 to 6.50
Cleveland	6.00 to 6.50
St. Louis	5.00 to 5.75
Composition Brass Borings	
New York	4.75 to 5.00
Yellow Brass Tubing	
Cleveland	4.50 to 5.00
Light Copper	
New York	5.50 to 5.75
Chicago	5.00 to 5.25
Cleveland	5.50 to 6.00
St. Louis	5.50 to 5.75
Light Brass	
Chicago	3.25 to 3.50
Cleveland	3.50 to 4.00
St. Louis	3.00 to 3.25
Lead	
New York	3.50 to 3.62½
Cleveland	3.00 to 3.50
Chicago	3.00 to 3.25
St. Louis	3.25 to 3.50
Zinc	
New York	2.25 to 2.50
Cleveland	2.25 to 2.75
Chicago	2.50 to 2.75
St. Louis	2.75 to 3.00
Aluminum	
Clippings, new, soft, Cleve.	13.00 to 14.50
Clippings, hard, Cleveland	9.00 to 10.00
Borings, Cleveland	5.00 to 6.00
Mixed cast, Cleveland	7.50 to 8.50
Mixed cast, St. Louis	7.00 to 7.50

Secondary Metals

Brass ingot, 85-5-5-5	9.00
Remelt aluminum No. 12	12.25 to 13.00

Metals

Demand is Quieter but Prices Are Well Maintained—Zinc at Close to 5-cent Level

New York—Demand for nonferrous metals was less active last week but prices were maintained at the higher prices reached recently. The quieter situation was not surprising in view of the recent active pace of buying. Copper, lead and zinc producers are working on codes under the National Industrial Recovery Act.

Copper—Electrolytic metal apparently was on the verge of advancing to 9.00c, Connecticut, last Monday but this was prevented by quieter domestic demand and easing of prices in foreign market. As the week developed some speculative interests became nervous and offered metal at 1/8-cent under the market. Firsthands, however maintained a firm position at the 9-cent level. The outlook in the trade seems to be for still higher prices. Stocks have been cut onsiderably during the past few months and it is the opinion that recovery measures will require a minimum price of more than 9 cents to place more companies in the profit column. Copper and brass mills have been encountering the best demand in two years or more with operations now reported at around 70 per cent. Leading mills announced an 8 per cent wage increase Friday.

Lead—Prices were advanced $2 a ton further Monday to 4.50c, New York, and 4.35c East St. Louis. Buying was lighter but still in good volume. Sales for July shipment are estimated at 39,000 tons, the heaviest tonnage since July, 1931. Bookings for August already total around 20,000 tons.

Zinc—The market was extremely strong due to a tight position in ore. Smelters were unable to book much ore at offering prices and the metal jumped to 4.90c to 4.95c Friday. Sales were not heavy but followed recent good buying. Bookings in June for both spot and futures delivery were the heaviest for any month since January, 1930. Stocks in June were cut over 12,000 tons.

Tin—Trading was hindered due to rapid fluctuations in sterling exchange which resulted an extremely uncertain price situation. Business for the week was light with much of this being in resale metal. International Tin committee has asked tin producing countries to support its restriction scheme which already has resulted in an extreme price rise.

Antimony—The market strengthened considerably with prices rising to above the 7.50-cent level.

Sulphate Price Advanced

New York—Sulphate of ammonia in bulk has been advanced $2.50 a ton to $24, port. A shortage has developed in toluol and xylol. Benzol buying is also active, but in better supply. Prices are firm, unchanged.

Coke By-Products

Per Gallon Producers' Plants, Tank Lots	**Spot**
Pure benzol	$0.28
90 per cent benzol	0.23
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.153 to 0.173
Per Pound at Producers' Plants	
Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.20

Quicksilver Firmer

New York—Quicksilver prices are firmer, small lots quoted $62.50 to $63.50, a virgin flask of 76 pounds. The minimum price on round lots is $62 a flask, against a recent minimum of $61.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper			Straits Tin		Lead	Lead	Zinc	Aluminum		
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	New York Futures	N. Y.	East St. L.	St. L.	98-99%	Antimony Spot, N. Y.	Ingot Nickel
July 8	9.00	9.12½	8.75	47.00	47.20	4.40	4.25	4.77½	*22.90	6.50	35.00
July 10	9.00	9.12½	8.75	47.25	47.37½	4.50	4.35	4.85	*22.90	6.75	35.00
July 11	9.00	9.12½	8.75	46.00	46.15	4.50	4.35	4.85	*22.90	6.75	35.00
July 12	9.00	9.12½	8.75	47.12½	47.25	4.50	4.35	4.85	*22.90	6.90	35.00
July 13	9.00	9.12½	8.75	46.87½	47.00	4.50	4.35	4.85	*22.90	7.25	35.00
July 14	9.00	9.12½	8.75	46.62½	46.75	4.50	4.35	4.92½	*22.90	7.50	35.00

*Nominal quotation. Market range 19.90c to 22.90c.

Here and There in Industry

ROLLER BEARING CO. OF AMERICA, Trenton, N. J., has passed to the control of Joseph C. Trainer, a state senator of Pennsylvania. William Devalleria has been appointed general manager, and the sales of the company continue under the supervision of E. C. Gainsborg, sales manager.

□ □ □

National Alloy Metal Co. Inc., Shreveport, La., has been dissolved.

□ □ □

Highland Iron & Steel Co., Terre Haute, Ind., is working at capacity and is employing additional men.

□ □ □

Chapman Price Steel Co., Indianapolis, will have its plant under full operation shortly, with about 500 men employed. Half this number already have been recalled.

□ □ □

Noblitt-Sparks Industries Inc., Columbus, Ind., is adding to its working force as a result of increased demand for products of its heater division.

□ □ □

American Brake Shoe & Foundry Co., New York, is operating its plant at Chattanooga, Tenn., at full time five days a week. R. E. Jones is superintendent.

□ □ □

Titusville Iron Works, Titusville, Pa., has been awarded blow-off tanks, air receivers and two boilers for two Allegheny river locks now building, by Vang Construction Co., Pittsburgh.

□ □ □

Crucible Steel Co. of America, New York, is repairing and refitting its Sanderson Bros. works at Syracuse, Ind., after idleness of 30 months, and about 800 men will be employed.

□ □ □

Chain Belt Co., Milwaukee, has practically doubled malleable castings production in the past three weeks and has recalled 80 workmen. Working hours have been increased to a full week.

□ □ □

Great Western Steel Co., Chicago, which recently purchased the United States Metal Products Co., has completed plans for a large addition to its plant, construction to be started immediately.

□ □ □

Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has turned over to the county of Jefferson the operation of the system of schools it has conducted privately for many years. The 12 schools hereafter will be part of the Alabama public school system.

□ □ □

Lynch Corp., Anderson, Ind., manufacturer of glass machinery, is operating 24 hours a day and is subletting work to Anderson Engine & Foundry Co., Philip Cook Machine Co. and the R. G. W. Foundry Co.

□ □ □

Farrel-Birmingham Co. Inc., Ansonia, Conn., raised all hourly wage rates 10 per cent, effective July 10, at its Ansonia and Derby, Conn., and Buffalo plants. Normal working week will be of five days of eight hours each.

□ □ □

Anderson Stove Co., Anderson, Ind., has resumed full-time schedule and is subletting orders for castings to the Anderson Engine & Foundry Co., Anderson, Ind., which has increased employment at the latter's plant.

□ □ □

Earle Gear & Machine Co., Philadelphia, has taken the contract for operating machinery for the Harvey canal bridge in Jefferson parish, Louisiana. This includes complete operating machinery for a double-leaf bridge of 95 feet total span. The machinery will weigh about 17 tons.

□ □ □

Young Radiator Co., Racine, Wis., has business on books at practically 33 per cent above the same period last year. A large order has been placed by Tropic-Aire Inc., Minneapolis, for car heater core and tank assemblies.

□ □ □

Worthington Pump & Machinery Corp., New York, has been awarded 12 pumps and two air compressors for No. 2 and 3 lock and dam on the Allegheny river by Vang Construction Co., Pittsburgh.

□ □ □

Key Boiler Equipment Co., St. Louis, booked $160,000 in new business during June and in the first week of July added $35,000 in new orders. It manufactures oil stills and brewing equipment.

□ □ □

Indianapolis Power Hammer Works, Indianapolis, has obtained a lease on a building at 309 West Maryland street and will move its manufacturing operations from Mars Hill, a suburb and expand its facilities.

□ □ □

Green Bay Drop Forge Co., Green Bay, Wis., specializing in automotive forgings, already operating with its largest force in recent years, has been forced to put on a night shift to keep pace with specifications. Second quarter volume of business equaled second quarter of 1930 and exceeded that of 1931 and 1932.

□ □ □

Nielsen-Bruening Engineering Co., Beloit, Wis., established two years ago to manufacture draft gages for boilers and stokers, has bought the Beloit Mfg. Co., manufacturer of pumps and other power plant specialties. Production is being consolidated in the plant of the latter. Additional equipment will be purchased.

PHILO BRAND

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Ohio Ferro-Alloys Corporation
Canton, Ohio
Plant at Philo, Ohio

CHICAGO DETROIT

Construction and Enterprise

New England

BOSTON—Caputo Iron Works Co. has started the manufacture of architectural iron work, fire escapes and similar products, at 25 Gladstone street, East Boston, Mass. Vincent R. V. Caputo is president.

EVERETT, MASS.—Everett Oil Burner Co. Inc. has started the manufacture of oil burners at 44 Garden street, with offices at 698 Broadway, Everett. The company's capital is $50,000. George C. Torngren is president, Otto P. Torngren vice president and Clifford W. Torngren treasurer.

LYNN, MASS.—Lion Products Co., Max Zalger proprietor, 7 Liberty square, Lynn, Mass., has started the manufacture of a line of automobile specialties, including license plate holders, fender flaps, windshield wipers, and chain adjusters.

PROVIDENCE, R. I.—Acme Tank & Welding Works Inc. has been incorporated with 100 shares no par value to manufacture metal products, by William J. G. Lawton, Providence, R. I., and Joseph M. Connelly, Edgewood, R. I.

New York

BUFFALO—B. W. Howard Corp. has been incorporated with $20,000 capital to manufacture tools and machinery, by Ralph M. Andrews, 30 Norwood avenue, Buffalo, and associates.

NEW YORK—Anglo-American Metals & Ferroalloy Co. has been incorporated with $5000 capital to deal in metals, by Meyers & Sherwin, 285 Madison avenue, New York.

New Jersey

HOBOKEN, N. J.—Schock, Gusmer & Co. Inc. has been incorporated with $100,000 capital to manufacture machinery, by Thomas H. Hagerty, 344 George street, New Brunswick, N. J.

PASSAIC, N. J.—Passaic Metal Products Co. has been incorporated with 200 shares no par value to manufacture metal products, by William M. Gurtman, 143 Prospect street, Passaic, N. J.

Pennsylvania

MEADVILLE, PA.—Hookless Fastener Co. has announced a $200,000 building program to be commenced shortly, a new plant building to be ready for occupancy by Jan. 1, 1934.

Ohio

CLEVELAND — Harrington Piston Rings Inc. has been incorporated with $25,000 capital, by M. B. & H. H. Johnson, Union Trust building, Cleveland.

Michigan

DETROIT—Diamond Pattern & Mfg. Co., 702 St. Antoine street, has been incorporated with $5000 capital to manufacture metal and wood patterns, by Hollis A. Place, 4756 Seminole avenue, Detroit.

DETROIT—Cunningham Stoker Co., 2832 East Grand boulevard, has been incorporated with 5000 shares no par value to manufacture heating appliances, by James G. Cunningham, 356 South Piper boulevard, Detroit.

HIGHLAND PARK, MICH.—Centerlock Drill Bushing Co., 12125 Cardoni street, has been incorporated with $50,000 capital to manufacture drill bushings and similar products, by Leo P. Rabaut, 19240 Burlington drive, Highland Park, Mich.

NILES, MICH.—Plant of the Niles Foundry Co., idle for a year, was practically destroyed by fire recently, with loss of about $10,000.

Indiana

ANDREWS, IND.—Glaze Mfg. Corp. has been incorporated with 20,000 shares no par value to manufacture metal products and machinery, by Bruce Glaze, J. K. Gleason and E. Lesh.

FORT BRANCH, IND.—Emge Packing Co. will start work at once on a 4-story building for enlargement of its beef refrigerating department, which will necessitate much new refrigerating equipment.

FORT WAYNE, IND.—Real Magnet & Wire Co. Inc. has been incorporated with $90,000 capital and 6000 shares no par value to manufacture wire and insulating material, by W. F. Real and associates.

FORT WAYNE, IND.—Consumers Pipe & Supply Co. has been incorporated with $10,000 capital to deal in pipe and fittings, by James F. Arnold, J. Travers Arnold and Evert C. Arnold.

INDIANAPOLIS—R. L. Dorsey Mfg. Co. Inc. has been incorporated with 20 shares no par value to manufacture metal products, by Robert L. Dorsey, John E. Johnson and associates.

RUSHVILLE, IND.—All Rite Co. has been incorporated as a reorganization of a former company of the same name, to take over the latter's assets. Luncheon and restaurant equipment is manufactured. Dwight G. VanOsdal is manager.

Illinois

CHICAGO—Ace Junk Dealers Inc., 2534 West Huron street, has been incorporated with $5000 capital to operate a waste material business, by Ader & Ader, 11 South LaSalle street.

CHICAGO—Cortland Junk Co., 1946 Cortland avenue, has been incorporated with 200 shares no par value to operate a waste material business, by Maxwell N. Andalman, 188 West Randolph street.

CHICAGO—Monex Chicago Inc., 55 East Washington street, has been incorporated with $20,000 capital and 300 shares no par value to manufacture change-making and similar machines, by Vose & Lind, 140 South Dearborn street.

CHICAGO—Wilkes Iron Co., 5033 South Carpenter street, has been incorporated with $10,000 capital and 250 shares no par value to manufacture and deal in metals, by Max Haleff, 610 North LaSalle street.

CHICAGO—Great Western Steel Co., 2300 West Fifty-eighth street, recent purchaser of United States Metal Prod-

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. . . . for quality

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plus
Mechanical Control
plus
Expert Supervision
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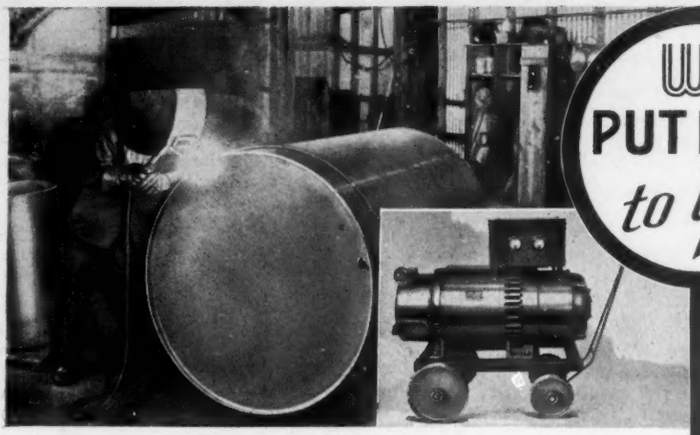
IN STANDARD AND SPECIAL ANALYSES

CENTRAL IRON & STEEL COMPANY
HARRISBURG, PA.



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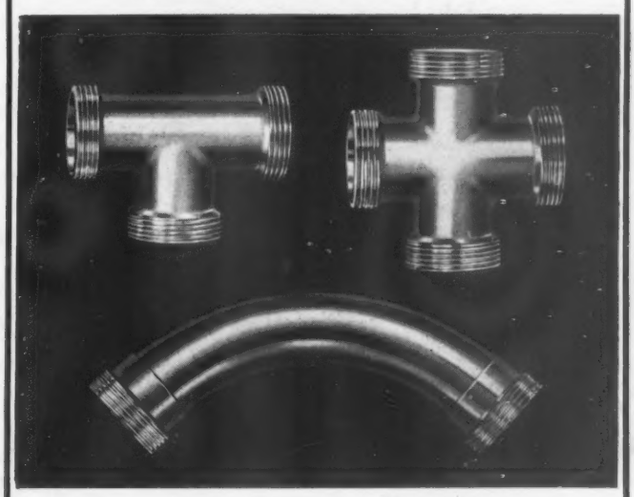

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ucts Co., will start construction at once on a large plant addition.

GRANITE CITY, ILL.—City council has ordered a preliminary survey by the Caldwell Engineering Co., Jacksonville, Ill., for a municipal light and power plant to cost about $750,000 and a waterworks and distributing system at about $1,000,000.

Missouri

NORTH KANSAS CITY, MO.—Wurtzberger Brewing Co., G. S. Wurtzberger, 102 East Ninth street, manager, asks bids on an 8-story brewhouse, 40 x 125 feet, bottling house, 50 x 125 feet, near Tenth street and Burlington avenue, to cost $120,000. A. C. Wiser, 3714 Broadway, Kansas City, Mo., is architect.

Southern States

NEW ORLEANS—Commercial Iron & Metal Co. Inc. has been incorporated with $1500 capital by Joseph Spiegel, president.

NEW ORLEANS—Wind-Way Fan & Ventilator Co. of Louisiana, has been incorporated with $1100 capital by Archie G. VanDenburgh, American Bank building.

Oklahoma

BARTELSVILLE, OKLA. — Phillips Petroleum Co., Phillips building, has let a contract to Henry Vogt Machine Co., Louisville, Ky., for fabrication and installation of two all-welded steam generating units at its refinery at Kansas City, Kans.

Texas

AUSTIN, TEX.—Peerless Metal Products Corp. has been incorporated with $2000 capital to manufacture metal products, by C. W. Moore and Benjamin J. Ryan.

BIG SPRING, TEX.—Cosden Oil Co. has let contract to Winkler-Koch Engineering Co., Wichita, Kans., for installation of new cracking stills and general construction of the distillation system at its refinery here.

HOUSTON, TEX. — Stanolind Pipe Line Co., Philcade building, Tulsa, Okla., plans a 10-inch pipe line 31 miles long to Texas City, Tex. W. G. Heltzel, Philcade building, Tulsa, Okla., is general superintendent in charge.

TEXAS CITY, TEX.—M. W. Kellogg Co., New York, has been awarded a contract for construction of stills and general construction of a refining plant for the Pan American Petroleum Co., New York, to be built here. S. B. Schapiro is chief engineer in charge of construction.

WICHITA FALLS, TEX.—Texas Pipe Line Co., O. R. Burden First National Bank building, division manager, plans a 6-inch pipe line from its main system near here to Young and Jack counties, to cost about $160,000, including a pumping station to be equipped from other stations. Replacement of wooden roofs with steel roofs on tanks is estimated to cost $50,000 additional.

Wisconsin

BARABOO, WIS.—City water commission closes bids July 12 on a 3-ton hand traveling crane, runway and roller bearing geared trolley.

BELOIT, WIS.—Freeman Shoe Mfg. Co., 300 East St. Paul avenue, has let contracts for a 2-story boiler plant addition, 45 x 55 feet, to cost $30,000 with equipment.

EDGERTON, WIS.—A special election resulted in decision to build a municipal electric power and light plant and to purchase the transmission lines and other equipment of the Wisconsin Power & Light Co.

GREEN BAY, WIS.—Commonwealth Electric Co., St. Paul, Minn., has been awarded contract for equipment for electrification of the municipal waterworks plant here, at $6843. August Icke is city clerk.

MADISON, WIS.—Oscar Mayer & Co., meat packers, will build a boilerhouse addition 45 x 60 feet.

MANITOWOC, WIS.—Rahr Malting Co. has let a contract to the Mackenzie-Hague Co., Minneapolis, Minn., for construction and equipment of a malt plant addition with capacity of 2,500,000 bushels, increasing its malting capacity to 7,500,000 bushels.

MENOMONEE FALLS. WIS.—A Milwaukee syndicate represented by E. Gerald Walker, 601 Security building, has leased the beet sugar plant of the Menomonee Sugar Corp. and will remodel it into a brewery at cost of about $100,000.

MERRILL, WIS.—Merrill Mfg. Corp. has been incorporated by W. J. Tesch, Paul Gebert Sr. and F. E. Taylor to engage in manufacturing bright wire goods and metal stampings.

MILWAUKEE—Koller Tool & Die Co. has been formed by Valentine Koller, formerly vice president of the Universal Tool & Die Co. A new shop is being equipped at 2019 South Kinnickinnic avenue.

MILWAUKEE—United States Metal Casket Corp. has been incorporated with 50 shares no par value to manufacture metal caskets, by W. J. Werner and W. J. Polk.

MILWAUKEE—City council has authorized construction of municipal filtration plant estimated to cost $4,500,000 if and when funds are made available by the R. F. C. Joseph P. Schwada is city engineer.

MILWAUKEE — Cleveland Tractor Co., Cleveland, has placed an order with the Wisconsin Motor Co. for $75,000 worth of engines to power a large number of tractors sold to the government for its forestry progam.

MILWAUKEE — Surface Protection and Engineering Co., 2824 East Hampshire street, has been organized by Glenn Rogers, formerly on the engineering staff of the Chain Belt Co., to manufacture asphalt emulsions for industrial and municipal use.

WAUKESHA, WIS.—M. Yundt Co. plans a machine shop addition to cost $28,000 with equipment.

WAUPACA, WIS.—Power plant at the Wisconsin veterans home and hospital here was damaged $40,000 by tornado when the brick stack was blown down on the boiler room and engine house. Replacement will be made at once by Col. W. A. Holden, commandant.

WISCONSIN RAPIDS, WIS.—Wisconsin Valley Improvement Co., George W. Mead, president, is seeking enabling legislation for several projects, notably the proposed Knowlton hydroelectric power plant. Estimate for power house is $218,700; equipment $250,000; transmission line $110,500; dam and dike $450,000.

Pacific Coast

LONG BEACH, CALIF.—Consolidated Aircraft Corp., 2050 Elmwood avenue, Buffalo, R. L. Fleet, general manager, plans construction of an aircraft building plant. A 25-year lease has been obtained on a site at the airport.

LOS ANGELES—Richfield Oil Co., 551 South Flower street, plans rebuilding its absorption plant and casinghead refinery on Signal Hill, Long Beach, Calif., recently burned.

PITTSBURGH, CALIF.—Great Western Electro Chemical Co. plans to build an addition to its plant costing $30,000. Leland Rosener, 233 Sansome street, San Francisco, is engineer.

Dominion of Canada

CALGARY, ALTA.—M. Merriweather, Los Angeles, heads a syndicate to build an absorption gasoline and carbon black plant here with annual capacity of 11,000,000 gallons of gasoline and 18,000 tons of carbon black, from waste gas.

NEW WESTMINSTER, B. C.—Pacific Coast Terminals Ltd. is considering new dock facilities to cost about $30,000.

PITTSBURG, CALIF.—Great Westsion will ask bids soon on a 500,000-gallon steel tank and concrete reservoir of the same capacity. Plans and specifications are by George H. Power, township engineer. J. J. Holman is town clerk.

CHATHAM, ONT.—Water commissioners are considering erection of an elevated steel tank as part of waterworks improvements. Wynne-Roberts Son & McLean, Toronto, Ont., are consulting engineers. T. M. S. Kingston is city engineer.

COWANSVILLE, QUE.—Bids are being taken for a 50,000-gallon steel tank on steel tower 64 or 75 feet high, by W. F. Vilas Co. Ltd., Cowansville. Automatic sprinkler equipment to cover 92,000 square feet of floor is also asked.